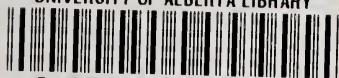


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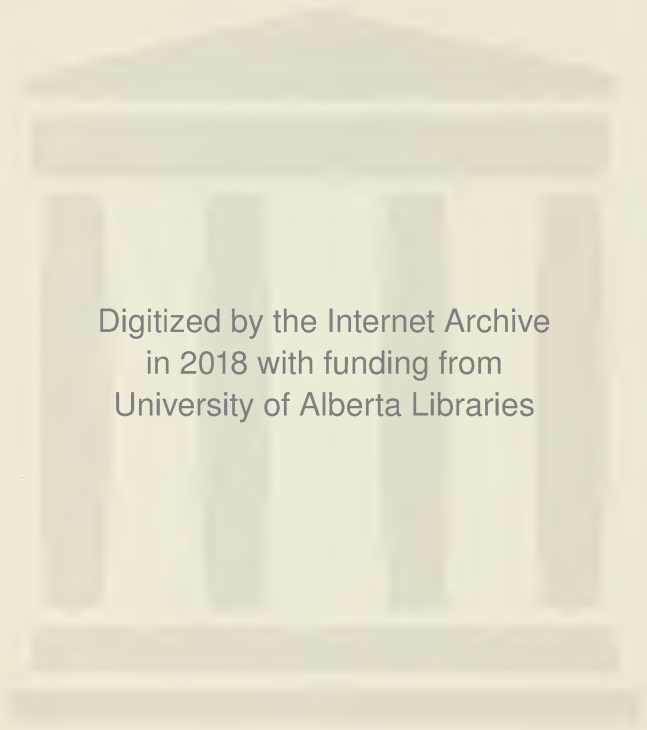
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THE IMPROVEMENT OF READING

WITH SPECIAL REFERENCE
TO REMEDIAL INSTRUCTION

by
LUELLA COLE, PH.D.

FARRAR & RINEHART, INC.
PUBLISHERS NEW YORK

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In memory of
my father

HARRY JOSHUA COLE

an expert and
omnivorous reader
whose daily round of patient
work made my own
education possible

103586

PREFACE

THE relative brevity of this book, as compared with many other texts in the field, is the result of a strict adherence to the three principles on which it is based. First, it is based on objectively proven facts: any relevant points that did not rest upon actual experimentation have been omitted. Second, it is practical: only those matters that are of immediate use to a teacher have been included. Third, it is unbiased: all aspects of reading have been treated with equal respect.

Throughout the book there is special emphasis upon diagnosis and remedial treatment. If a disproportionate amount of space seems to be devoted to remedial work, it is because a similarly disproportionate amount of a teacher's time must be given to pupils who are having difficulty. In general, teachers are willing enough to give the necessary time to those who need help; what they often lack is accurate and detailed knowledge of appropriate procedure when a child fails to make the expected progress. This information the present volume is designed to supply.

The book contains numerous sample exercises that apply directly to everyday reading problems. The procedures or materials involved are described in detail, since there is little value in suggesting a type of remedial treatment without giving sufficient data for its application. Presumably no one will use all the exer-

cises mentioned; each teacher should select those that seem to her most useful.

Finally, it should be pointed out that all the exercises are so arranged that they need not be marked by the children. Consequently, unlike other remedial materials now available, they may be used over and over again, in fact until worn out by handling. Whatever exercises a teacher prepares for one class become, therefore, permanent additions to her equipment; in the course of time she will develop for herself a working library of materials adapted to the needs of individual pupils. Perhaps the main handicap in the teaching of reading is the lack of such properly individualized equipment. One purpose of the present book is to offset that handicap by showing the average classroom teacher how to prepare the materials she needs.

It is hoped that any teacher in service will be able to find among the variety of different procedures suggested in these pages something that will help her improve her teaching of reading.

L. C.

Berkeley, California
April, 1938

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PART I

INTRODUCTION

II

HISTORY OF METHODOLOGY IN THE TEACHING OF READING

READING is the basic subject in elementary school. Ability to read not only marks the difference between the literate and the illiterate person; it is also an absolutely necessary basis for other subjects in the curriculum. To be sure, in the earliest grades a child may compensate for a deficiency in reading by accurate listening and a good verbal memory, but the time soon comes when progress in all academic subjects very nearly ceases unless he can read. It is therefore essential that teachers should understand the nature of the reading process, in order that they may give the greatest possible aid to pupils in the mastery of this fundamental educational tool—the ability to read.

There is no really good point from which to start an explanation of the reading processes. Any approach is sure to be piecemeal. Reading is a highly complex performance in which vision, eye movements, inner speech, memory, word-knowledge, inferences, past experience, and general intelligence all combine to produce the effects observed. No writer can describe the whole process as an entity; one must start with some phase of the total problem, proceed gradually to other phases, and finally synthesize the various salient parts into a coherent whole. No matter where one starts, the beginning is likely to seem a bit muddled.

The writer has chosen to begin with a brief history of teaching methods and a still briefer description of the reading situation that faces any teacher in any average American classroom. This historical introduction may serve as a background for understanding many of the basic problems that arise in the teaching of reading. The student is advised, however, to reread this chapter after he has finished the book. Any historical introduction has more meaning to a reader after he understands the material for which the introduction provided the perspective.

METHODS OF TEACHING READING

Although there have been innumerable minor variations, there appear to have existed not more than four basic methods of instruction. Most experienced teachers use combinations and modifications of two or more of these methods; fortunately, only a few teachers ever become hypnotized by a single system. Since all the techniques to be discussed have some advantages, teachers should be acquainted with all of them. They are then less likely to regard any single method as the law and the gospel. The four fundamental techniques under consideration will be described in their appropriate chronological sequence.

1. *The Alphabetical-Oral Method*: Children who are taught by this method spell out each new word, as a first step toward learning it. The letters are not "sounded," as they are in phonetic teaching, but are actually spelled, just as they would be during a spelling lesson. This spelling is usually done orally; practically all reading is also oral. In the lower grades at least, the reading a child does to himself is merely in

preparation for reading aloud later on in the day. As the pupil reads "silently," he whispers the familiar words to himself and spells out any new words he meets.

This method of teaching reading—archaic as it may seem—has two distinct advantages over more modern methods. In the first place, a child learns to spell at the same time that he learns to read; that is, he is mastering two subjects simultaneously. The second advantage lies in the training he receives in spoken English. Through the constant emphasis on oral reading he acquires a clear enunciation. No method of teaching reading silently has either of these advantages.

On the other hand, the alphabetical-oral technique has both obvious and subtle disadvantages which far outweigh any possible transfer to other subjects in the curriculum. Its most easily observed drawback is the slowness with which children acquire even a small vocabulary. There is no reason why anyone should be able to spell every word he can read, because few people use in writing more than a tenth of their reading vocabulary. The method is also cumbersome and indirect. The same results can be achieved in less time if reading is isolated from both spelling and speech. Children who learn by this method read few books during their elementary school years. In fact, it is quite possible that the method was developed in the first place because only a few books were available.

Two other disadvantages are perhaps not so obvious as the small vocabulary. A child who has received this fundamental training in oral reading learns only with difficulty to suppress the habits of speech which have accompanied his earliest efforts. He may never

read "silently," except in the sense that he makes no noise; he is likely, throughout his life, to articulate each word more or less completely to himself. Since this inner speech is not in the least necessary and since it retards the rate, there is no excuse for training pupils in a set of habits that must be discontinued before they can learn to read efficiently.

Finally, continued training in spelling and in oral reading by no means guarantees a comprehension of what is read. The fundamental purpose in reading a book is to understand the ideas it contains, not to read it aloud for some other person's enjoyment. A child who has been trained for five or six years in oral work is usually able to read from a book with good enunciation, reasonably accurate pronunciation, and appropriate inflection. However, when he has finished reading a story quite satisfactorily, he is often unable to give any coherent statement of what it was about, because he has concentrated all his effort and attention upon the oral accompaniments of the reading process rather than upon the meaning of the words.

The alphabetical-oral method of reading is supposedly quite out of date, but one finds vestiges of it in many schoolrooms—especially in the first and second grades where, unfortunately, it does the most damage.

2. *The Phonetic Method*: Children who are taught by this method learn to read essentially through pronouncing words. The work starts customarily with words of one syllable. When a number of these have been memorized, the teacher introduces phonograms—usually called "word-families." For instance, the pupil first learns the word "and," which is a phonogram; he then proceeds to "sand," "band," "land,"

and so on. By such work children learn the sound of each letter and of common combinations of letters within a word. A little later they begin to read longer words, breaking them up into syllables, pronouncing each syllable, and then saying the word as a whole. The phonetic method usually involves a good deal of oral reading, although this is not a necessary accompaniment; the drill in words is, of course, largely oral. The words are not spelled as in the alphabetical method, but are "sounded" phonetically.

This technique of teaching has its advantages. A pupil soon discovers that letters have sounds and that the consonants at least always have the same sound. He knows also that a long, unfamiliar word can be broken down into pronounceable units and then recognized from its sound. When, therefore, he meets such a word as "butterfly," he can take it to pieces, find in it the familiar words "but" and "fly," pronounce the middle syllable correctly, and recognize the word from its sound, since it is almost certain to be in his speaking vocabulary.

This method provides a means for learning a considerable number of words with relatively little effort. For example, if the teacher starts with the phonogram "in" she can first teach such words as "tin, thin, win," and so on; then she can proceed to "ink, sink, think, rink," and the like; from there she can continue to "ing, ring, bring, thing, sing," and so forth. While the learning of these successive series takes time, the total number of words acquired in a semester is far greater than the number that can be learned in the same time without phonetic work.

This method has, however, disadvantages which prevent it from being completely satisfactory. The

really fundamental difficulty is the nature of the English language, which is unfortunately not phonetic. Although the consonants keep the same values, each vowel has numerous sounds—and there is usually no indication in any given word of which sound is to be used. One cannot teach a language by exclusively phonetic methods unless the sounds and the spelling have a fixed and invariable relationship. One outstanding characteristic of American speech further complicates the situation and often prevents the recognition of a word even when each syllable has been pronounced correctly. In most polysyllables, only the vowel in the accented syllable retains its characteristic sound, while all other vowels are elided, or become blurred, or change into short “u’s.” Consequently, if a pupil pronounces the syllables by giving each vowel any of its correct sounds, he will come out with a word that is quite unrecognizable because it contains nothing but accented vowels. For instance, the word “impossible” is usually pronounced, “‘mpōsbl’,” only one vowel being actually sounded; it is the foreigner who says “‘īm-pōs-sī-ble.” If a child pronounces correctly and clearly the syllables “gōv-ēr-n-měnt,” how is he to know that this word is the familiar “gōv-münt” of daily speech? Some languages lend themselves easily to a phonetic approach, but English is not one of them.

Children whose teaching has strongly emphasized

* Naturally, one would prefer that a pupil should pronounce this word correctly. The sad fact is that he will not, and most of the adults in his environment will not. A child has to build up his reading vocabulary by associating what he sees with what he has heard. In this instance—as in many others—what he has heard is wrong. The point is that when he pronounces such a word correctly he cannot identify it from his daily experiences outside of school, because American speech is far more unphonetic than American spelling.

phonics usually progress at a slower rate during the early years of elementary school than children taught by less oral methods. This result is due in part to the generous use of oral reading that usually accompanies the phonetic drill. Under such circumstances, the pupils are certain to develop the same slow and cumbersome manner of speech that has been described in the preceding section.

However, the phonetic method has values which should not be lost. It is helpful in the first grade in teaching words having a common element; it is useful in the third and fourth grades in teaching children how to break words into syllables; and it is invaluable in furnishing pupils with a method of attack on new words. It is not, however, a complete method that can be used to the exclusion of all others.

3. *The Look-and-Say Method*: Of all reading methods this is undoubtedly the most widely used at the present time. The essential technique is simple. The teacher writes a word on the board, pronounces it for the children, tells them to look at it, and asks them to repeat it after her; she may also use it in a sentence, or demonstrate its meaning in any way that will help the children to remember it. The emphasis is upon the meaning of a word and its appearance; the children do not sound out the separate letters or syllables. What the children actually learn to recognize is the general outline of the word. Such words as "gingerbread" or "beautiful" are learned readily, because the letters going above and below the line make a definite visual pattern that is easy to see and to remember. On the other hand, such words as "these," "those," "this," and "them" are constantly confused, because the visual patterns are so nearly identical.

Although there is some pronunciation of the word, the exact amount varying with the personal inclinations of the teacher, the method rests primarily upon visual memory and the association of appropriate meanings with visual patterns. Theoretically, no word is ever taken to pieces or even removed for its meaningful context, but in actual practice some analysis of words almost inevitably occurs.

This method has clear advantages, as long as the words being dealt with are "sight" words which cannot be learned by any phonetic approach. The study of these words as wholes is the only way of learning them. The method has a further and fundamental advantage in that speech is never made a necessary accompaniment of reading, even though it may be used when a word is first presented. The speech mechanism does not, therefore, become connected with the reading process, because the learning of words is mainly visual. This method is generally accompanied by purely silent reading, with a still further elimination of any possible connection between reading and speech. As a result of this emphasis upon visual rather than auditory memory for the recognition of words, from the first a pupil reads more rapidly by this method than by any other.

The "look-and-say" method is not, however, without its drawbacks. A child's acquisition of words tends to slow down after the first grade unless some work in phonics is introduced. Most pupils who have been taught by this method exclusively fail to make the expected additions to their reading vocabulary in the later grades because they have been given no general technique for attacking unfamiliar words. In the early stages of learning a child does not read to himself any words he has not already been taught by the teacher.

By the middle of the second grade, however, he encounters many words he has never been specifically taught. Since he cannot recognize them as old friends, he must either break them down into syllables that can be pronounced or else skip them. A purely sight method, while giving excellent introduction to silent reading, is not adequate for building up as large a vocabulary as a child needs in the middle and upper grades of elementary school, because it does not equip him with any technique for dealing with the unfamiliar.

Another disadvantage of the "look-and-say" method is revealed by its nickname. Its critics call it the "look-and-guess" system. For instance, a child confronted by the word "foot" takes a look at it and first guesses it to be "too." When this guess is not accepted, he takes another look and guesses it to be "for." When pressed for a better identification, he makes repeated guesses—sometimes using one or more of the letters in the word and sometimes trying to infer a possible meaning from its use in the sentence. If the pupil has had nothing but visual training, his only possible procedures are to recognize the word from previous acquaintance with it or else to guess its meaning from the context. While the ability to infer meaning is of undoubted value, it should not be the only method of learning a new word. Nor can it be used to advantage by children until they have built up considerable vocabulary. Thus, in a sentence containing nine words a child may infer the meaning of one if he knows the other eight; inferring the meaning of two is difficult; supplying concepts for three or more is practically impossible. As any primary grade teacher knows, pupils often try to guess the meaning of an un-

familiar word by studying the picture beside it, by using their imagination, or by leaning on any other available aid. The look-and-say method undoubtedly increases this tendency to guess—sometimes to fatal proportions.

Most children who have been trained by this method try to memorize the appearance of all words they meet, without attempting to sound them in any way. Sometimes pupils are taught by such an exclusively visual method that they cannot sound even the initial letter of any word. They do not, indeed, know that letters have sounds. They usually progress well enough for the first 150 or 200 words, but then they reach a sort of saturation point. They are remembering, from appearance alone, as many separate words as they are capable of recalling.

The outstanding advantages of the look-and-say method are, then, its foundation in a purely visual process and its disassociation from speech, while its weaknesses lie in the development of guessing and in the tendency of the child to attempt a memorization of all words from their appearance alone.

4. *The Phrase-Reading Method*: This method is, in its essentials, an expansion of the look-and-say method; the units dealt with, however, are whole phrases or short sentences instead of single words.⁶ * That is, instead of teaching separately the words “in,” “the,” and “room,” the teacher puts on the board the entire phrase “in the room.” The children repeat the phrase over after her; then she gives them another short series of words, such as, “Who is there?” Each phrase is learned as a unit. The method probably owes

* Superior numbers refer to the bibliography at the end of the chapter.

s development to the undeniable fact that a good reader of any age will group individual words into phrases as he goes along. Even comparatively young children sometimes read in this way. None of this evidence proves, however, that children learn to read more economically if taught by phrases rather than by isolated words.

The main advantage of this method lies in the training it gives in recognizing phrases as meaningful units. The disadvantages, however, are numerous. In the first place, children tend to recognize a word only when it is imbedded in the particular phrase in which it is first learned. If a pupil has learned to recognize the words "at our house," he may be entirely unable to identify the word "house" in the sentence, "The old house is grey." Since the single words within a phrase may be used in an almost inexhaustible number of combinations, it seems distinctly uneconomical to teach by phrases; the pupil does not see the individual words clearly and therefore cannot transfer his learning to other sentences in which they are certain to appear.

Further objection to the method comes from the failure of some children to make any progress at all. It is the good reader at any age who breaks up a sentence into phrases. The poor or inexperienced reader always progresses a word—or less—at a time. In the first grade all children are inexperienced readers, and most of them are—by adult standards—inefficient. It is the exceptional child who does not plod through a sentence. The average pupil in his initial year in school sees at one time from half a word to a single, short word; phrase-reading is not possible until the

eyes are mature enough to see two or more words at a single fixation.

The phrase-reading method would, then, be excellent if children were not children! Because it is a typically mature form of procedure it is too difficult for pupils in the early grades of elementary school.

5. *A Desirable Integration of Methods*: The first hundred words are apparently best taught by the look-and-say method. It is simple, direct, and understandable to the childish mind. When children teach each other, it is the method they voluntarily use. As soon as a pupil has learned enough words to serve as a basis for elementary phonetic work, the teacher should introduce him to the commonest word-families. From this training the child gains the ability to pronounce at least the initial letter of a word and acquires a much larger vocabulary than he would develop without phonetic drill. The look-and-say method combined with simple phonics is sufficient for the first two and a half grades. At this time an introduction of phrase-reading is desirable. The pupil needs also to learn how he can break down polysyllables into pronounceable units. In other words, the look-and-say, the phonetic, and the phrase-reading methods are all useful, but in different amounts at different levels in the elementary school. It should be noted that none of these methods necessitates the use of oral reading. To be sure, phonetic work is oral but it consists of word study, not consecutive reading. The child does not, therefore, build up any bad habits of eye co-ordination.

The one method that is undesirable for the teaching of reading is the alphabetical-oral, because of its relative inefficiency in vocabulary building and its tendency to develop inner speech. The method has,

However, advantages which are lost by the use of any of all of the other three. If it is not used, a teacher must compensate for its loss. Her procedures in spelling and oral English must be different from those that are adequate under an oral reading system. Children who learn to read by visual methods recognize words quickly, but they do not remember the exact order of letters within each word; consequently, there is little transfer from reading to spelling. To offset this loss, the teacher must give intensive drill in spelling. She must also give training in speech, because extensive silent reading does not bring about correct and clear pronunciation. There is no need, however, for oral reading as a means of drill in speech. It is far better that a child read a story to himself and then tell the class, in his own words, what he has read. The speech training inherent in oral reading should certainly not be lost, but silent reading is not the subject in the curriculum by means of which the training in speech can best be given. This work belongs rather to oral English.

6. *Causes of Changes in Method:* Within the past thirty years the methods of teaching reading have altered profoundly. These changes are mainly a reflection of an altered environment, which in turn has caused a revision of the policies and objectives of the elementary school. The chief cause of change as regards reading is the ever-increasing necessity for every person to be able to read rapidly, accurately, and frequently. An average ten-year-old child of today probably reads more in a year than his grandfather did in six. Up until fifty years ago the majority of people lived in a rural environment. They had opportunity to read only a few newspapers, practically

no magazines, and only an occasional book. Most public libraries are not more than fifty years old, and most loan libraries not more than ten. Of the profusion of magazines now on the stands, not over a dozen have been in existence for twenty-five years. As far into the dim past as seventy-five years ago, the amount of reading matter available was amazingly low, when judged by modern standards. The writer's own father was forced in his childhood to read the Bible, *Pilgrim's Progress*, and a volume of ancient history over and over again because these three books were literally the only ones obtainable in the village where he lived. The local newspaper, which was four pages long, appeared every two weeks; a few copies were printed on a hand press, but even this limited supply was rarely sold out. This situation was not extreme. In fact, it was so typical that Carnegie—who had experienced it—founded public libraries in which a child who wanted to read could find books.

S U M M A R Y

There are many ways of teaching reading, all of which have their strong points and their weaknesses. None should be considered perfect and none should be condemned. A wise teacher will learn to combine these various methods, keeping the best features of each. When one considers the methods in their chronological order, one is impressed with the evolution of reading from a subject designed to train pupils in correct speech to a subject by means of which children are taught to get meaning from the printed page. The present-day profusion of reading matter and the ever-increasing demands upon reading skill have forced a

vision of the curriculum in this subject. The emphasis in teaching has changed from a training in recitation to a training in getting meaning as quickly and accurately as possible. Ability to read well is no longer an ornament but a necessity. The changes in method just described have come about because of the increasing demands of society for a general public that can—and will—read.

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III

THE PRESENT-DAY SITUATION IN THE AVERAGE SCHOOL

About fifteen or twenty years ago educators began to realize that the frequent retardation of children not only failed to bring about the expected mastery of subject matter but also developed in these children numerous undesirable traits of personality. Up until that time the main objective of the elementary school had been the acquisition of basic facts and skills. If a child did not learn the specified facts and develop the specified skills, he was not promoted. The curriculum was so difficult that only children with an I.Q. of 110 or more were able to complete it without retardation; those with an I.Q. from 95 to 110 were able, with two or three retardations, to graduate. Children with I.Q.'s below 90 failed over and over again and finally left school in the third, fourth, or fifth grades. Since that time the pendulum has swung—possibly too far—in the opposite direction; the modern objective is the development of a normal personality, almost regardless of the mastery of subject matter. Children have been studied intensively by many people from many points of view in order to determine what is a normal social group in which a child may be expected to develop an acceptable personality. It seems clear that a child should be with other children of the same age, the same size, and the same stage of emotional and social

development, both in and out of school. As a result of this modern emphasis upon the child as an individual rather than upon the curriculum, a teacher finds in her class a group of children of about the same age and social development but with abilities in any academic subject ranging from first or second grade to the seventh or eighth.

1. *Individual Differences in Achievement*: This wide dispersion of abilities is the most basic single fact in determining modern methods of teaching. Individual instruction is practically forced upon the teacher because her class, while having a fair degree of social cohesion, has almost no intellectual unity. The matter is so important that an actual illustration seems worth while. Table I shows the scores made in speed, vocabulary, and comprehension in the third, sixth, and ninth grades of a single school. The grade norms are ruled across each section of the table.

There are two points to be noted. (1) The range of reading ability in any one of the three phases investigated is never less than four years. It was, for instance, the task of the sixth-grade teacher in the school tested to teach thirty-nine children who varied in speed from the second to the eighth grade, in vocabulary from the third to the ninth, and in comprehension from the third to the eighth. Obviously, no assignment can properly be made to this class as a group. (2) The variability is usually least in the lowest grade and most in the highest. The upper limits of achievement rise as the children become older, but the lower end of the class makes little progress. As a result, the two ends of the distribution are constantly getting further and further apart.

These results illustrate the customary situation

TABLE I

SHOWING SCORES IN SPEED, VOCABULARY, AND COMPREHENSION
IN GRADES 3, 6, AND 9 OF ONE SCHOOL
(Scores from Pressey Reading Tests)

SPEED GRADES				VOCABULARY GRADES				COMPREHENSION GRADES			
	3	6	9	Score	3	6	9	Score	3	[6	9
9			2	9000-9200			1	58-9			1
9			1	8700-8900			1	56-7			
9			4	8400-8600			2	54-5			2
9			1	8100-8300			2	52-3			2
9			2	7800-8000			5 H9	50-1			3 H9
9			4 H9	7500-7700		1	2 L9	48-9			8
9			7	7200-7400		1	3	46-7			4 L9
9			3 L9	6900-7100			1 H8	44-5		1	3
9		1	2 H8	6600-6800			3 L8	42-3		2	1 H8
9			1	6300-6500		2	3	40-1		2	2 L8
9		1	L8	6000-6200		1	4 H7	38-9		1	
9		2	2 H7	5700-5900		2	1 L7	36-7		3	2 H7
9		2	1 L7	5400-5600		3	2 H6	34-5			
9		3	H6	5100-5300		5		32-3		2	1 L7
9		7	1	4800-5000		6	L6	30-1		5	H6
9		6	L6	4500-4700		4	1 H5	28-9		7	
9		3	H5	4200-4400		4	1	26-7		3	2 L6
9		3	1 L5	3900-4100	1	2	L5	24-5		1	1
9	2	1	1	3600-3800	2	3	H4	22-3		2	H5
9	1	3	H4	3300-3500	3	1	1	20-1		1	1 L5
9	2	1	1	3000-3200	3	2	L4	18-9	2	3	H4
9	4	3	L4	2700-2900	3	1	1	16-7	3	1	
9	6	1	H3	2400-2600	8	1	H3	14-5	2	1	L4
9	6			2100-2300	6		L3	12-3	7	2	1 H3
9	4	1	L3	1800-2000	2			10-1	11	1	
9	3			1500-1700	3		H2	8-9	6	1	L3
9	4			1200-1400	3			6-7	3		
9	2	1		900-1100	2		L2	4-5	4		
9	2			600-800	3		H1	2-3	2		
9	1			300-500	2		L1	0-1	1		
9	2										
9	2										
al	41	39	34	Total	41	39	34	Total	41	39	34

in the average American school. The teacher is, however, not so badly off as it may seem, because silent reading is not a social procedure, although its results may be used socially. It is an operation carried on in comparative isolation. Each member of a class can, and usually should, read different books; no one need be inconvenienced by this situation, nor is any confusion in the classroom in the least necessary. The teacher must realize that there is no efficient way of teaching reading to a class as a whole. Because of the need for constant adaptation of reading matter to each child's level of development, a teacher should understand the nature of the reading process and the various techniques in the diagnosis of reading difficulties. She needs to know what books are useful at different stages, what remedial materials may be used with children showing this or that difficulty, and what methods are desirable at each level of development. It is only by such expert knowledge that she can hope to instruct with any efficiency thirty-five to forty children, each of whom presents a different combination of abilities and defects. The natural variability among children is sufficient to present a teacher with as many problems as she can handle; the modern tendency to promote by age rather than by mastery of subject matter increases the complications until group methods of instruction in academic subjects become impossible.

Whatever combination or modification of the general methods of teaching reading a given teacher may select, she should not for a moment suppose that she can simply train the whole class at once by her approved techniques. She must expect to study each child, to adapt her methods to his needs, and to treat him always as an independent unit. There are in the cur-

riculum other subjects in which participation of the class as a group is feasible and desirable. Indeed, the results of reading may often enter into group activities. But both the mastery of the process and the act of silent reading are essentially nonsocial. The teacher should develop her own combination of methods for teaching reading, but she should be guided in her application by the needs of each child in her room.

2. *Classes in Remedial Reading:* The most recent development in the field of reading is the emergence of the remedial reading class. Such groups have appeared chiefly in junior high and high school, although there have been a few both in elementary school and college. Since a teacher will inevitably hear a good deal about remedial reading, she should have some understanding of the causes for this recent development.

The basic cause is the failure of schools to adjust the curriculum to the current promotion policy. As noted above, children are at the present time promoted mainly by age rather than by achievement. As a result, the average intelligence per grade has become at least a year lower than it was twenty years ago. The average achievement per grade has also been considerably reduced. Remedial reading classes are necessary because pupils of low achievement are promoted into the upper grades as soon as they are old enough to be there; this policy produces the wide range of abilities demonstrated in the previous table. Remedial classes were not necessary until recently because the children who did not learn to read reasonably well were retained in the lower grades and left school without ever reaching either junior or senior high school.

To offset the modern promotion policies there

have been, to be sure, improvements in the teaching of reading. It is probable that better teaching would carry improvement still further. It is, however, doubtful if the best teaching in the world would ever be good enough to compensate for the modern policy of promoting by age. The standard of achievement per grade is permanently lower than it was. In order to adjust the work of each grade to this lower level of ability and achievement, a few schools have made efforts to alter the curriculum. Practically no school, however, has reduced its curricular requirements sufficiently to offset completely the decrease in ability. As a consequence, the material assigned to pupils at any level above the primary grades is too hard for the reading ability they possess. As the poorer readers are promoted from grade to grade, their standing in relationship to the upper limits of the class becomes more and more remote, as shown in the above table. Now that modern promotion policies are in full swing in most school systems, the teachers in the grades above elementary school find themselves burdened with many pupils who cannot even begin to read the assignments. It is these pupils who are sent to the remedial reading class.

Unfortunately the curriculum is the hardest thing in any school to change, because it is upheld by tradition. The junior high schools have really made efforts to adjust classwork to the abilities of the pupils. Such attempts in the senior high school are less frequent and far less fundamental. The curriculum as it now stands is merely a reduced form of the course of study offered when children were promoted on the basis of achievement alone. There have been additions and subtractions here and there, but the basic courses have re-

ained—even though in some cases they have become mere shadows of their former selves. Until the course of study in junior and senior high school is really adjusted to the average ability of pupils promoted by the, the need for remedial reading classes will remain. Their existence is a blatant criticism of both teaching methods and curricular demands. It is probable that these classes will continue to become more frequent rather than less in the next ten or fifteen years. They could, of course, eventually disappear.

In the meantime these classes are doing excellent work in many ways; they are developing new methods of diagnosis and new techniques for treatment of poor readers. In the course of time these methods will become incorporated in regular instruction. Such incorporation will in turn reduce the number of pupils needing remedial work in their later years. The classes will not, however, disappear until the curriculum demands from the pupils only such abilities as they possess.

The methods used in the remedial reading classes involve nothing that could not be used in any classroom, provided the classroom teacher had sufficient time at her disposal. The methods are, in general, individualistic and specific. Each technique used is based on diagnosis of a particular defect and is directed toward the curing of that single deficiency. By such an approach the best teachers of remedial classes are gradually working out a new method of instruction in reading. It is the writer's guess that these new methods will gradually be either substituted in the classroom for the methods of group instruction now in existence or integrated with them so thoroughly that

individualized drill will become a commonplace instead of a rarity.

S U M M A R Y

In literally hundreds of experiments the wide differences in reading scores among children in the same grade have been demonstrated. A teacher can expect to find in her class a range of ability equal to at least three grades, and probably more. As the differences among pupils in the same room have become greater with the introduction of newer promotion policies, the school has found itself forced to offer remedial work in reading long after the children are supposed to know how to read. It is never safe to forget about these individual differences. The latest type of adjustment is shown by the remedial class which is becoming more and more frequent in the schools. It exists essentially because children have been promoted beyond their ability. Until the curriculum is made easier and until analysis of error becomes more frequent than it is now, the remedial reading class will continue to exist. If teachers once understand the forces that brought the class into being, they will be sympathetic toward the aims of this newest arrival on the scene.

III

EYESIGHT AND READING

Every teacher knows that a child needs a normal pair of eyes if he is to learn how to read; indeed, this fact is so commonplace that it is often overlooked. As a result, many children fail to progress in the early grades because their eyesight is not good enough to read the words, while other pupils progress only slowly, because they are uncomfortable and distraught whenever they try to read.

A teacher should not expect that children will complain directly of eyestrain. The only eyes a child knows anything about are his own, and he assumes that everyone else's eyes are just like his. No child has any standard of what constitutes normal vision. A pupil may, for instance, be unable to see anything written on the blackboard, and he may wonder for years why teachers write things where no one can see them! Yet it may never occur to him to complain, because he does not realize that other children see what he does not. Defects of eyesight, except in their most extreme forms, have to be inferred from a child's conduct, not from his remarks.

DEFECTS OF EYESIGHT

It is not necessary for a teacher to understand the anatomy and physiology of the eye in order to do her

part in assuring adequate eyesight for members of her class. Diagrams and explanations of the eye will help her very little. She needs to know how children behave when their eyes are not functioning properly; she does not need to know what peculiarity of structure or reaction in the eye produces which disorder. Even if she did need this information, she is not likely to get it from any ordinary diagram.

There are four common defects of vision, each of which interferes more or less with learning to read. These four are—in order of their frequency of occurrence in childhood and their seriousness in conditioning reading—farsight, astigmatism, muscular disbalance, and nearsight. For the most part, the symptoms of inadequate vision are the same for all defects.* The symptoms will therefore be listed and discussed without respect to particular conditions, except where some item of behavior is pathognomonic. The problem of which reaction indicates which abnormality is not the teacher's business. She needs merely to recognize any peculiarities of behavior and send the child showing them to an oculist for diagnosis.

When pupils enter school only approximately 20 per cent have absolutely normal, fully developed eyes.^{10, 5} This situation is due in part to the usual incidence of eye defects in any population and in part to mere immaturity. Thus, about 15 per cent of young children are nearsighted and 40 per cent have a sufficient degree of astigmatism to need correction.^{10, 5} A much larger number, however—about 60 per cent—of children at entrance to school are farsighted. The exact number showing muscular disbalance is not ac-

* This statement refers to a child's general reaction to inadequate vision. Naturally, the physiological symptoms are different for different defects.

rately known but is certainly as high as 20 per cent and probably higher at this age.¹⁰ The above figures add up to well over 100 per cent because children often have two defects simultaneously. The only two that are mutually exclusive are farsight and nearsight; either condition may, however, appear in combination with either or both of the other two abnormalities. At the entrance to school, it is probable that not far from 50 per cent of the children have eyes that are either too immature or too defective for the strain of reading. As late as the seventh grade, 44 per cent of the 1,685 children tested in one city still had defective eyes.⁷ Nearsight is thus a vital problem, especially in the first grade, where visual immaturity has the greatest and most permanent effect upon reading.

Farsightedness is a normal condition of early childhood, just as nearsightedness is a normal condition of old age. Throughout their infancy and pre-school years all children are farsighted. The eyeballs do not reach their adult shape until a child is eight or nine years old. Although about 15 per cent of the general population remains farsighted, two-thirds of those who show this condition at entrance to school outgrow the defect as their eyes mature. Muscular imbalance is also a characteristic of infancy and early childhood. A normal baby usually alarms his parents by appearing alternately cross-eyed and wall-eyed, but as he grows older his eyes focus with greater accuracy. At first he sees only large objects; soon, any ordinary small object is clearly visible. A word is, however, a very small object, and many six-year-old children do not yet have sufficient control to focus their two eyes with exactness upon anything so tiny. The eye muscles, like all other muscles in the body, grow stronger with use; many children who can focus their eyes only with

difficulty upon words in the first grade have no trouble at all by the time they are a year older.

The great importance of eyesight in influencing reading has been shown repeatedly. One sample study was made of the eyes of a group of inefficient readers as compared with those of a large unselected number of average and superior readers. There was no difference between the two groups in the incidence of near-sight, but 17 per cent more of the poor readers were farsighted.⁵ In fact, 75 per cent of the children who read badly were farsighted—some with and some without astigmatism.⁵ Only 11 per cent of these pupils had normal eyes.

Further evidence has appeared in the form of case studies of children whose reading was obviously conditioned by defects of eyesight. The following cases are typical.

Dick, a normal boy eight years of age, was referred to an educational clinic because of inability to learn to read. He presented a history of dislike for school, for teachers, and for reading. Among other tests this child was given a thorough eye examination. He was moderately farsighted. The important discovery, however, was that his two eyes did not fuse. Reading was done with either eye singly. During this time the image arising from the other eye confused and interfered with the work of the eye being used. Binocular vision was absent in reading and only fair for distance vision.

Because of the boy's dislike for school he was sent away to a completely new environment—to a boarding school where he was placed in a special room. At first he wrote out letters a foot high on the blackboard. He took daily exercises for bringing about better fusion.

the end of the first two weeks in his new school, Dick had learned to recognize 11 words. In the next ten weeks he had mastered a basic vocabulary of 219 words. During the tenth week, after 150 treatments with the stereoscopic apparatus, Dick's fusion had improved enough so that he could see words in the prism. At this point Dick could and did take the Gates tests, earning a reading grade of 1.4 and reading age 6.8. Six months later his two scores were respectively 3.1 and 8.8. Since his actual age is only 8.9 he can now be regarded as normal.^{8, *}

Wilbur displayed considerable bravado, strutting about the room at his full height and remarking cheerfully, "I can read good." A new brown suit anticipated some months hence and threatened to spill him at any moment, for Wilbur was quite a little boy. Perhaps the newness gave him courage, for certainly no one did not credit him with reading "good." He clasped the proffered book firmly in one stubby hand preparing to read from page thirteen of a certain primer. He began in the *lower right-hand corner* of the *right-hand* page, pointing out the lines from *right to left* with his left forefinger. The performance was nothing we had witnessed before in the name of reading, and without the pointing we might never have known where the start was made.

He proceeded glibly—"Run, run, come and, away, on to the tree, come come, play, play and come to-day!" And then he stopped for the obvious reason that he could think of nothing more to say. We asked him to place his finger on a certain word. He shuffled around in the new suit, rocked the chair on two legs, opened the book very slowly, and smiled wanly. The game was up!

He hadn't the slightest idea which word was

* Used by permission of the *Journal of Educational Research*.

“play” nor which was any other word we mentioned, although he had been exposed to this beginning vocabulary for more than one semester. No formal test was needed to demonstrate his complete lack of reading vocabulary.

Wilbur was an intelligent child, his score on the Detroit First-Grade Intelligence Test placing him in the middle group, Y, when he was six years old. He attended school regularly and gave no trouble. He was generally liked; his clean, well-cared-for appearance, his ready smile, and big brown eyes made a quick appeal. But he was an utter failure at his school work, which was, of course, mainly reading. His mother could not explain his performances, and no facts in his history seemed pertinent to the situation. She was loath, however, to accept the father’s verdict that he was “stubborn and could read if he would,” and expressed her willingness to co-operate in any way.

In the attempts to solve the riddle of his unusual performance, Wilbur became an object of increasing interest. He was unstable and erratic about things in general, and, although his desire to learn was earnest and most evident, he trailed off into nothing with many tasks just as he did in reading that first day. Random associations mixed things up generally. He often seemed bent on doing something or other, just anything. Being told that his name was to be written on the board, then asked what the word was, he replied, “My sister’s name is Ruth.” He persistently interpreted “Run, Wilbur” by trying to stand on his head, probably because in trying to make him understand what the game was he had been told to do whatever the written command indicated, even if it told him to stand on his head.

He did not know what was meant by a letter, a word, or a sentence, and his attitude of extreme dependence was a great hindrance. He never did anything through to a finish without repeated efforts to

et help when it did not seem necessary. His attention as very easily distracted and dangerously "thin."

It is easy to discover that a child has no reading vocabulary, but quite another thing to determine why. It is easy to see that a child does not attend to a given object, but it is again quite another thing to determine the reason. This is, of course, an important matter, since attention is fundamental to learning. The difficulty may be congenital or it may be acquired. The two possibilities present entirely different situations to be met, it may be, in totally different ways.

One day, Wilbur was presented with a chevron pattern in color cubes such as are commonly used in the kindergarten. He was expected to copy this pattern, which was coarse and not intricate, and the task was new and altogether attractive so he went about most happily. The clue to all of Wilbur's difficulty appeared with sudden emphasis in this situation. He was unable to do the copying because, after a few minutes of application, his eyes began to stream water. The eye specialist, to whom he was taken at once by his mother, found him to be very farsighted and fitted him to glasses.

Corrected vision, however, could not automatically give him a reading vocabulary, and now he must insert a host of new images with a tangled mass of past experiences with words. The record shows that this was accomplished with about thirty minutes of instruction daily, the period of disturbed imagery covering about four months. There was nothing "special" about the method used in teaching him, but the point is that many readjustments must be made by a child in such a situation is a very important one. It takes time to do this. This fact should be recognized, and great patience shown during this period. No one can tell in how many guises any certain word may have appeared to vision so badly focused, and confusion is to be expected.

On March 8, about two months after the eye correction had been made, he was still apt to lose his place and to include in the sentence he was reading some rather distant portion of the page. In another month, however, losing the place was exceptional, and he had read sixty-five pages of the primer. In another two weeks, he had completed eighty-nine pages, his speed of recognition was noticeably greater, his expression good, and his pride in accomplishment was beautiful to look upon. Also he had learned to work acceptably with a group.

"I read seventeen pages last night," he announced one morning, and without checking the accuracy of the statement, we concluded that Wilbur was well started on the road to success in reading. He was promoted the following June and each semester thereafter, until now he has reached Grade V-B. Meanwhile, he has been transferred to another public school where his records in reading have justified our conclusions that poor vision was the cause of his difficulty.⁹ *

It should be clear from the above discussion that some per cent between a third to a half of the children entering the first grade are not yet ready to read because of defective or immature eyesight. What most of them need is merely time in which to grow a little older and to develop the necessary control. Reading always puts strain upon the eyes, but at no level in school is the strain so severe as at the beginning when the children are inefficient and their eyes are unaccustomed to hard work.

* This is an excellent example of how a child with inadequate vision *avoids* reading, even when he holds a book in front of his face. It was not until this boy actually used his eyes that they began to water. If he had really read with them they would have shown this reaction sooner.

This selection was used by permission of the *Journal of Educational Research*.

Because of the influence which inadequate vision has upon reading, all teachers should learn to recognize the common symptoms of maladjustment. Teachers in the first grade and the remedial reading classes must be especially sensitive to the slightest abnormality of behavior on the part of any child during the reading period.

SYMPTOMS OF INADEQUATE EYESIGHT

The total number of symptoms have been grouped into those that are purely physical, those that are directly observable—usually during the reading process—and those that are indirect and general. No teacher should ever fail to recognize symptoms of the first two types since their connection with eyesight is so obvious. Those in the last group are by no means always due to poor vision. Inadequate eyesight is only one possible cause for such types of behavior, but it appears as at least a contributing cause so often that the reactions described later should make a teacher suspicious.

1. *Physical Symptoms:* The first and most obvious symptoms are abnormalities in the appearance of the eyes themselves. If a child's eyes water when he tries to read, if the lids are red and granulated, or if the eyes are swollen or inflamed, there is obviously one type of difficulty. A pupil who rubs his eyes constantly—whether or not he complains of discomfort—telling everyone in sight that his eyes itch and smart. These physical symptoms of distress are obvious. Unfortunately, some teachers fail to notice them.

2. *Directly Observable Symptoms:* Peculiarities

of posture and facial expression are significant. Children who hold their heads on one side as they read, pupils who scowl constantly, and those who hold the book either too close or too far away almost certainly have eye defects. If a child puts his head down in his arms on the desk to rest, this behavior should at once suggest eyestrain. If a child makes frequent efforts to get out of the light, or if he constantly holds his hand above his eyes to keep them in shadow, he is in need of attention. A child's reaction to words written on the blackboard is also significant. In any room there is likely to be at least one child who hardly sees the blackboard itself. There will be many others, especially in the lower grades, who recognize words from the blackboard but do not know the same words when they appear in a book.

Once in a while a teacher has an opportunity to observe muscular disbalance directly. If a child has been using his eyes intensively and looks up suddenly from his work, the teacher may notice that one eye is turned in or out a bit further than the other. This effect disappears quickly, because even a few seconds of rest bring the eye muscles back to their normal balance. Whenever a teacher has a fleeting impression that a child is slightly cross-eyed—even though his eyes soon appear perfectly normal—she should realize the significance of what she has seen.

There are other symptoms that children will tell the teacher about if she asks them, even though they may not mention these points voluntarily. Some pupils report that they see spots in front of their eyes, others that the words on the page jump around, others that the words look "foggy," and still others that the individual letters within a word are not clear. A still

her symptom may be observed when a child is reading aloud. He sometimes inserts into the sentence a word from the opposite page. This sudden shift of fixation is not due to mere perversity. It might be said in passing that the reversal of words and letters—such as reading “saw” for “was,” or “d” for “bib”—is not an indication of anything except immaturity. All children reverse letters until they are five or six year old, and some do not outgrow immature vision which causes these reversals until they are seven or eight.

An occasional child complains directly of headache, dizziness, or pain in his eyes. Such complaints are not, however, common, partly because children do not know how to describe their symptoms and partly because the pain acts upon a child to make him avoid reading and therefore prevents him from developing comfort at any future date. Many children with defective eyes never complain of pain because they never strain their eyes enough to develop any.

3. *Indirect Symptoms:* The two most common symptoms of this type are refusal to read and failure to learn, even though an effort is made. Actual aversion toward reading, as well as lack of interest in reading degrees, is often attributable to inadequate vision. Some of the careless readers who dash through their work at top speed react in this way because they are trying to relieve their eyes of strain by using them for as short a time as possible. These reactions are all abnormal responses to the reading situation. Of course, any perfectly normal child may get in one of these ways to a particular story, but not to any story whatever. Children with normal eyes and normal minds want to read.

If a pupil becomes nervous, irritable, or tired during the reading period, he is obviously straining himself in some way. The most likely explanation is visual fatigue. This explanation becomes the more probable if the nervousness and irritability are manifested whenever the eyes are used intensively and do not appear at other times. Naturally, not all bad temper can be attributed to inadequate vision, but such behavior is always a symptom of some maladjustment, of which poor vision is more often than not a contributory factor.

Two other types of behavior are significant. A characteristic procedure is sometimes shown when a child who has acquired a small vocabulary tries to read orally. He starts off by reading the first line fluently and easily, begins to stumble on the next few lines, gets worse and worse as he proceeds, and finally goes completely to pieces. If he is given ten minutes' rest and then asked to read the last few lines from his previous attempt, he will read them fluently and easily. By the time he has proceeded another ten or fifteen lines he again runs down. In other words, the particular passage read has nothing to do with the failure. The pupil is all right until fatigue develops—and it appears much too soon. The more tired he gets, the worse he reads. Another type of behavior is the substitution of ears for eyes. That is, the pupil listens intently to what is said by his teacher or classmates and substitutes what he hears for reading whenever possible. To be sure, some children—as will be explained later—have to learn how to read by using their ears and speech, because their visual memory is poor; but the continued substitution of ears for eyes,

combined with a continued avoidance of reading, is a type of behavior which is always significant.

S U M M A R Y

As already mentioned, a teacher should not wait for complaints of pain before she suspects visual inadequacy. Children show by their behavior when their eyes are not functioning normally. All a teacher needs to do is to see what she is looking at. If a child shows any of the symptoms enumerated above, he should be sent to an oculist for examination. It may be that the behavior comes from other causes than poor eyesight, but since this is the most likely cause, it should be investigated first. If a teacher waits for a child to complain openly, the correction of his eyes will come too late to prevent some of the worse maladjustments. The typical history of a child with immature eyes runs about as follows: In the first grade he tries to read. He does not see the words distinctly, unless he makes strenuous efforts to focus and accommodate his eyes; perhaps even with his best efforts his vision remains blurred. Because of the strain involved, he is practically certain to have pain. He keeps on trying for a while, but sooner or later he comes to the conclusion that reading is too hard for him—in fact, is something he cannot ever learn. Also, the results seem to him not worth the pain involved. Naturally, the pupil does not formulate the matter so definitely or objectively, but his whole attitude toward reading is that of a person who has tried and failed. Matters remain at this point for a year or two, during which the pupil tries every day in a half-hearted manner to do something he knows will make him uncomfortable.

With this attitude, he is beaten before he starts. By the second or third grade his eyes have reached their normal maturity. He could now learn to read with relatively little effort, but his progress is blocked by his deep-seated conviction that reading is, for him, impossible. As soon as he looks at a printed page, he is convinced he cannot read it. The really fatal outcome of allowing a child with immature eyes to attempt reading is the development of this defeatist attitude. The immaturity of his eyes is only temporary, but the attitude is all too often permanent.

It is unfortunate that it is usually the brighter children who develop the attitude just described. A dull child will go on docilely trying to read until the pain is so severe that his behavior reveals his condition. Intelligent children, however, are not going to do anything that makes them uncomfortable. The brighter a pupil is, the sooner he sees the connection between reading and discomfort. Whereas the stupid child goes on reading to the point of exhaustion, the bright child merely avoids the pain by avoiding the reading first! When he is asked if his eyes hurt, he says quite truthfully that they do not. Even if he goes through the motions of holding the book before him, he is likely to gaze right through the covers at the horizon and not see the words at all. If it were the stupid child who developed an aversion for reading, the situation would not be so serious. Dull children often dislike reading because they are given material that is far too hard, but they rarely develop the defense mechanism described above. Intelligent pupils usually take an intelligent way out of an awkward situation; unfortunately, this reaction results in considerable educational waste which would not occur if

ls were allowed to reach a sufficient level of maturity before they were subjected to the strain of reading.

Teachers in any grade, and especially the first, should be sensitive to all peculiarities of behavior which might suggest inadequate vision. Children will show their defects clearly enough; it is the teacher's blindness which so often leads to distress and difficulty.

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IV

APPROACHES TO THE READING PROBLEM

THERE is no single inevitably right way of approaching the problems of reading. Some people have excellent success when they begin with work in comprehension; others obtain equally good results by concentrating upon vocabulary; still others start with work for increasing the speed of reading, but their end results are of high quality. There are a few who content themselves almost exclusively with readiness to read, interest in reading, or deficiencies in eyesight. It does not seem to make any particular difference where one begins. Emphasis on any one or more of the different phases of reading will yield results. There is nothing too much feeling among those engaged in teaching either regular classes or remedial groups that "orthodoxy is my-doxo." The fact of the matter is that all kinds of approaches and methods are useful. The best procedure for any particular teacher depends in the main upon the nature of her interests, abilities, and personal traits. No one has yet had a relation about reading upon which others can depend. The occasional messiah, who believes devoutly that his is the only possible approach, is to be avoided and not followed. There is room for as many different kinds of approach to the teaching of reading or the remedying of weaknesses as there are different people engaged in the work.

Much of the trouble one has in dealing with the subject comes from the complex interrelation of the various phases of the entire process. This complexity has, however, definite advantages. It does not really matter which phase of reading is emphasized, because whatever improvement may take place in one phase promptly produces a change for the better in all the others. If a teacher uses exercises to increase the speed of reading she will find that her pupils have developed greater comprehension. If she adds five hundred words to their vocabulary, the children will certainly read faster because they will need to stop less often to puzzle over unknown words. They will also get more meaning because they know more words. If she starts with drill in comprehension, she will find that the pupils soon read more rapidly, because they know better what to look for and have a more definite purpose in reading. Those teachers who work mainly upon interests soon discover that the children are—perhaps for the first time in their lives—really enjoying their work. As a result of their greater enthusiasm they read faster than they ever did before. Because they read more books, they will increase their vocabularies. If one begins by making a study of readiness to read at any level in school, one will automatically solve many problems of slowness through preventing first the bad habits that lead to a deliberate reading rate. The same approach will produce better vocabularies and comprehension by the postponement of reading until the children are ready to learn. The teacher who starts her work by having every pupil examined by an oculist finds the reading of her class improved in all fields. The whole matter of where to begin and what to emphasize is, indeed, one of preference.

The repeated arguments about approach are strangely reminiscent of the tale concerning the seven blind men and the elephant! So many workers in the field seem to think that the one piece of the reading process they have gotten hold of is the only piece there is. It is the writer's own opinion that the best place to begin is with the mechanics. Other people, however, get equally good results by beginning elsewhere. Some people are extremely effective in some one phase, while others have no luck at all with it. When two teachers proceed in different ways but both get good results, neither is right and neither is wrong—they are merely different. Each teacher should find out by which approach she can make the most progress in the least time, and should then use it, in the firm confidence that whatever she does to improve any phase of reading will automatically bring about improvement in other elements.

In this book the writer has tried to give equal consideration to the problems of speed, comprehension, vocabulary, eyesight, interest and reading readiness.* Those who favor emphasis upon one field to the exclusion of all others are not going to be satisfied. It is, however, essential that a teacher should know there are many different ways of bringing about good reading and should feel tolerantly toward those who prefer to work along other lines than those she herself selects. The writer does not make any difference where one begins, or—within reasonable and sensible limits—what one emphasizes. The important thing is to begin somewhere.

* To be sure, the various fields are taken up one at a time—the simplest, first. Priority of position does not, however, mean importance.

PART II

THE SPEED OF READING

V

FUNDAMENTAL HABITS OF READING

Now reading is due primarily to the presence of one more bad habit in the fundamentals of reading—it is, the mechanical reactions of the eyes and vocal apparatus. It is therefore necessary for a teacher to understand the basic habits which underlie the entire reading process. If a child's mechanical habits are good, he will cover reading matter at a normal rate. At the same time his attention is free to concentrate on the meaning of what he reads, because the basic habits are truly mechanical and unconscious. Some teachers find no interest in the study of these fundamental responses because they regard reading as a purely intellectual process. These teachers are quite correct in regarding comprehension as the main objective of reading. What they do not realize is the close relationship between comprehension and the fundamental habits. Until the mechanical movements are at least established, there is no comprehension of consecutive reading matter. As long as these movements remain inefficient, comprehension suffers. A teacher should not, therefore, scorn the study of these simple actions, because—although mechanical—these habits are absolute essentials in good reading. Indeed, the more mechanical they are the better. They are real habits in the literal sense of the word; that is, they are

automatic responses made without intention or consciousness.

Regardless of teaching method, the average child develops more efficient skills as he grows older. Consequently, his rate of reading increases. There have been several thorough investigations of the rate at which children in the successive grades read. Results from five different studies ^{1, 3, 6, 7, 9} have been combined to furnish the norms for speed presented below. Naturally, the rate varies according to the difficulty of the reading matter used in each of these investigations; in all cases, however, the material was simple and contained few if any unfamiliar words. The average speed per grade, under ordinary methods of teaching, is presented in the following table:

GRADE	NUMBER OF WORDS PER MINUTE
3	95
4	153
5	189
6	215
7	237
8	253
9	269

Measurement of speed below Grade 3 is not advised, even if it were feasible. Primary grade children should be occupied chiefly with the acquisition of the simplest words and the establishment of correct habits. The rate at which they read connected matter is of little importance. In these initial years they should never be hurried—no matter how slowly they proceed. If a conscientious teacher is given a norm she is likely to push a slow class in order to reach the average indicated. Speed norms for Grades 1 and 2 are unreliable,

necessary, and dangerous; hence, they do not appear in the above table.

The basic habits upon which the rate of reading depends may be described under three headings: eye movements, vocalizing, and phrase-reading. The discussion should serve as a basis both for everyday classroom procedures and for the diagnosis of defects, with necessary remedial training for those pupils who abnormally slow.

DISCUSSION OF EYE MOVEMENTS

1. *Definition of Terms:* In order to discuss eye movements intelligibly one must be familiar with the technical vocabulary used in five different measurements. As the eyes move across a line of print they stop from time to time. These pauses are called *fixations*. During them the actual reading is done. While the eyes are moving, they see only a blur. The first measurement is made by determining (1) the average number of fixations per line. As long as reading is progressing normally, the eyes move toward the right from the beginning of a line to the end, but sometimes the reader loses his place or takes too long a jump and becomes confused. His eyes then move back on the same line from right to left until he can again pick up the meaning of the material. These movements in the reverse direction on the same line are called *regressions*. A second measurement is (2) the number of regressions per line. At the end of each line the reader must make a long jump from right to left in order to start on the next line. This movement is not a regression, but a *return sweep*. The third measurement, to be described in more detail later, is concerned

with (3) the accuracy of this return sweep. The pause made by the eyes at a fixation is very short, but it is measurable in twenty-fifths of a second. The fourth point to be considered is (4) the average length of the fixations. A comparison of the number of pauses per line and the number of spaces on the line tells how much the eyes saw at each stop. The width of the space within which the seen letters lie is called the *reading span*. If the fixations per line are few, the reading span is wide; if the fixations are many, the span is proportionately small. A fifth measurement is (5) the average width of the reading span.

In addition, there is the matter of rhythm in reading. This rhythm is not definitely measurable, but its presence or absence can easily be observed. If the eyes pause about the same number of times on each line in about the same place, the movements are rhythmic—regardless of the number of fixations involved. On the other hand, if the eyes stop twelve times on the first line, four on the second, nine on the third, six on the fourth, and fourteen on the fifth, there is clearly no rhythm at all. Like all muscular habits, eye movements are considerably more efficient when they are carried along by a smooth easy rhythm.

2. *Good and Poor Reading*: The above points are illustrated by the two samples presented below. The first sample is a record of the eye movements made by a good reader in the fifth grade. The second is a comparable record for a poor reader in the same grade. The story being read is printed as it appeared in the book. The children whose eye movements were recorded read to themselves, just as they normally would when reading a selection. Through the reading matter runs a line that shows the path taken by each

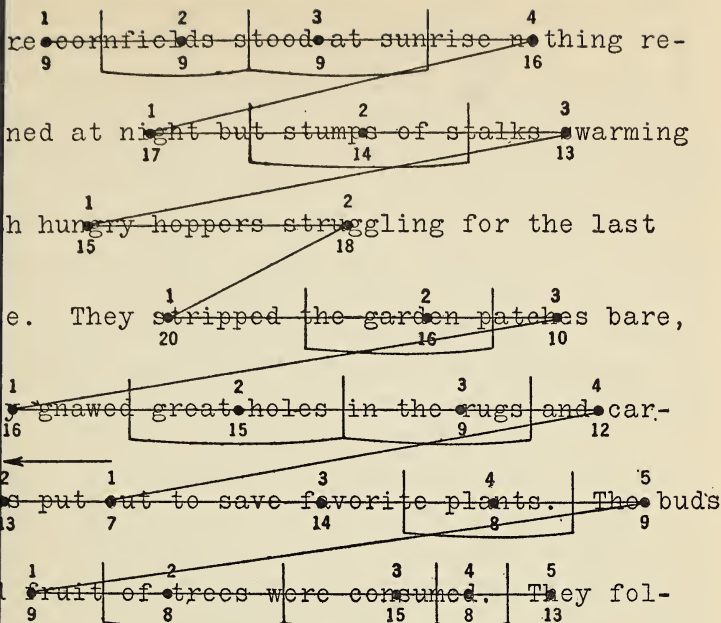


Fig. 1.—Eye movements of a good reader in grade 5. (O'Brien.⁷)

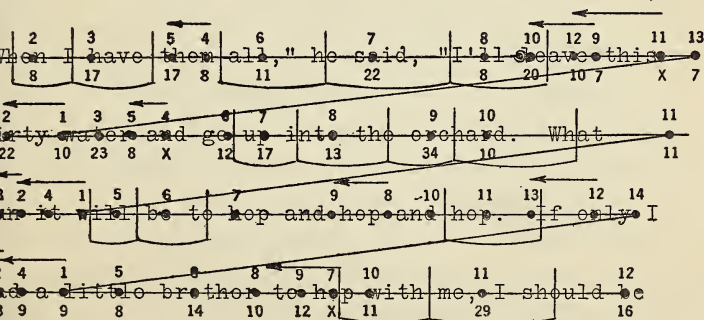


Fig. 2.—Eye movements of a poor reader in grade 5. (O'Brien.⁷)

child's eyes. Where a dot appears on this line, the eyes made a fixation. Above the dots are numbers showing the order in which these pauses were made. The good reader made his fixations in order from the left end of the line to the right, except for the sixth line. Here a regression is indicated by an arrow pointing toward the left. The poor reader shows three regressions on the first line, two on the second, four on the third, and three on the fourth. Each of these is marked by an arrow above the numbers. Under each dot is a figure showing how many twenty-fifths of a second the reader's eyes paused at that point. Thus, the good reader paused $9/25$ ths of a second for each of his first three fixations and $16/25$ ths for the fourth.

The upright lines through the printing indicate the length of the span where the length can be accurately determined. It is not possible to measure the span for the first and last fixations on any line, because there is no way of knowing how much of the space in the margin was seen at these pauses. It is also not possible to make an accurate determination where there is a regression. Those spans which are measurable have been indicated by a curved line connecting two upright lines. Thus, for the good reader the span of the second and third fixations of the first line are both measurable. The first and fourth are disregarded because it is not possible to measure out into the margin. Since this pupil took only three fixations on the second line, the middle span alone can be measured. For the poor reader, the second and third spans of the first line can be determined; then there is a regression, which confuses the situation and makes measurement impossible; the sixth, seventh, and eighth spans are marked. The remaining portion of the first line is so

fixed up that nothing can be measured accurately. In determining these spans one has to assume that the length of any single one reaches halfway from the fixation point where the eye is looking to the fixation points just before and just after. This assumption is arbitrary, but since the same regulations are applied to all records, it is possible to obtain comparable figures from different readers. The first span on the first line for the good reader is nine spaces wide; the second is eleven spaces wide. In measuring the width, he counts as a space each letter and each space between the words. The poor reader's first span was four spaces wide; his second, slightly over five.

The return sweep from the end of one line to the beginning of the next is shown by a diagonal line. These lines are at a somewhat sharper angle than is the case with ordinary reading matter, because the lines of this story have been spaced very widely apart to make room for the necessary statistical records. The poor reader made return sweeps at almost exactly the same angle; none of them were long enough, but at least they were all alike. Four of the six return sweeps shown for the good reader are parallel to one another, and a fifth is almost parallel. One, however, is at a quite different angle from any of the others.

The good reader moved his eyes with a fair degree of rhythm. Except for one regression, the movement of his eyes was always in the right direction, and the length of the jumps was about the same—with the exception of the third line. The poor reader shows no rhythm. He makes many regressions, and even where his eyes are moving steadily in the correct direction some of his jumps are appreciably longer than others.

The facts above described can be summarized

briefly in statistical form, so that the basic habits of these two children may be compared.

	GOOD READER	POOR READER
Average fixations per line	3.71	12.5
Average regressions per line .....	.14	3.0
Number of lines accurately begun.....	6 out of 7	0 out of 4
Average length of fixations	12/25 of sec.	13/25 of sec.
Average width of span	10.4 spaces	6 spaces
Reading time for 44 words *	10 seconds	26 seconds

It will be seen from the above table that the good reader is good because he uses few fixations, rarely makes a regression, and hits the beginning of each line accurately. The difference between the two in the length of the fixations is extremely small. The good reader reads faster because he stops less frequently, not because his pauses are shorter. The difference in the width of the span is the result of the number of fixations used; so also is the total reading time.

A fixation pause is extremely short; nevertheless, the number required is important. A pupil who uses only four pauses per line will obviously cover ground twice as fast as one who needs eight of the same length. Such a doubling speed is in itself worth while, on practical grounds. An excessive number of eye movements does more damage, however, than merely retarding the rate of progress. Any number of pauses above four per line breaks the material up into such small pieces as to be practically meaningless. For instance, the good reader saw at a single fixation such phrases as "stood at sunrise" in the first line, "the garden" in the third line, or "great holes" in the fifth. These are meaningful units. The poor reader saw such units as "I'll le" in the first line or "up i"

* The slower reader completed only 44 words; therefore, the first 44 of the other record have been taken for comparison.

and "ard. Wh" in the second. These units have no meaning whatever. An unusual number of pauses, therefore, operates not only to reduce speed but to reduce meaning.

Slow reading has two further and more indirect effects upon the degree of meaning obtained. If the beginning and end of a chapter are separated from each other by two hours of time, the reader is not likely to integrate the ideas on the last few pages with those on the first, because he has forgotten the beginning before he reaches the end. He rarely sees the chapter as a whole as well as the pupil who covers the entire material in forty minutes and consequently has less time to forget. Then, too, the eye movements of a poor reader are so clumsy and inefficient that they absorb most of his attention, leaving him no energy to devote to comprehension. He is busy with the mere process of seeing the words. As in all learning, one must master elementary habits so thoroughly that they function automatically before one can concern himself with any other meaning. The achievement of correct eye movements is desirable at the earliest possible moment, not as an end in itself, but as an absolutely essential step in the development of comprehension.

The following case studies are indicative of the results one can expect from training in mechanical habits.

A. P. was a ten-year-old child in the fourth grade. His general average for all work was only fair, while his reading was reported as poor. His rate was 73 words per minute on a test for which the fourth-grade norm is 160 words. His comprehension was equally low. A. P.'s parents were foreign born and he heard

little, if any, English at home. This boy showed an average of 11.7 fixations and 2.4 regressions per line, and an average duration of 13.1 fiftieths of a second. The remedial training he received was given for a half-hour daily over a period of seven weeks. At the end of this time he showed only 7.8 fixations and 1.0 regression per line, with an average duration of 13.0 fiftieths of a second. His scores on the Courtis test revealed more than a doubling of his earlier rate and comprehension.^{7, *}

L. C. was the fastest and best reader in his fifth-grade room. He showed no evidence of any defect in the mechanics. His initial Courtis scores gave him a speed of almost eighth-grade level and a perfect record in comprehension. His average fixations and regressions per line were 5 and 0.3 respectively. It would seem as if this boy were already reading as well as he could. At the end of seven weeks' training, however, his rate had increased to 395 words per minute—a good speed for an adult—while his comprehension was 97 per cent. His total understanding was actually greater than before, because on the first test he answered all of 47 questions correctly while on the second he answered 62 out of 64 correctly. His fixations per line had been reduced to 3.5 and his regressions to 0.2.^{7, *}

M. C. was a twelve-year-old pupil in the seventh grade. She had the reputation of being a hopelessly slow but careful reader. She was, in fact, the typical, slow, word-for-word reader. She not only fixated each word once but many of them several times. Such simple words as "is, to, no, from, and, they" required two or more fixations. Her initial Courtis rate score was 170 words a minute—a score just halfway between the fourth- and fifth-grade norms. Her comprehension of the little she read was perfect. She averaged 8.4 fix-

* From J. A. O'Brien, *Silent Reading*. By permission of The Macmillan Company, publishers.

tions and 2.5 regressions per line, with a duration of 10.3 fiftieths of a second. She was overcautious, meticulous, and dawdling. She showed a slow, plodding, leisurely mode of procedure which is probably the result of either a lack of interest or a superfluous amount of oral reading. At the end of the training period M. C. had reduced her fixations to 6.5 per line and her regressions to 1.6. The duration remained the same. On her final Courtis test she read at a rate of 368 words per minute—a speed nearly normal for her grade—and a comprehension of 96 per cent of the material she read. Her total understanding was enormously improved. On the first test she got 28 answers right out of 28, but on the last, 65 answers right out of 67.⁷ *

The training received by all three of these children was primarily in speed. The teachers were instructed to use no more than five minutes at the beginning of the half-hour reading period for preparation, in thought or vocabulary, to help the children understand the work better. Even this small amount of time devoted to comprehension might be omitted if the teacher thought the pupils did not need it. At least the last twenty-five minutes of the daily period was spent on achieving greater speed. It should be noted that the increases in comprehension were not less marked than those in rate. The only reasonable explanation is that good mechanics automatically lay the foundation for good comprehension and permit a child to understand what he reads as well as he can, in view of his intelligence and experience.

3. *Oral and Silent Reading*: In the early grades of most schools, the majority of teachers use oral reading. During the first half year of school it possibly

* From J. A. O'Brien, *Silent Reading*. By permission of The Macmillan Company, publishers.

does no harm because the pupils cannot read faster silently than they can orally; but at any later time, training in oral reading is undesirable for reasons which will appear shortly. To illustrate the nature of eye movements for oral and silent reading two more plates are presented.

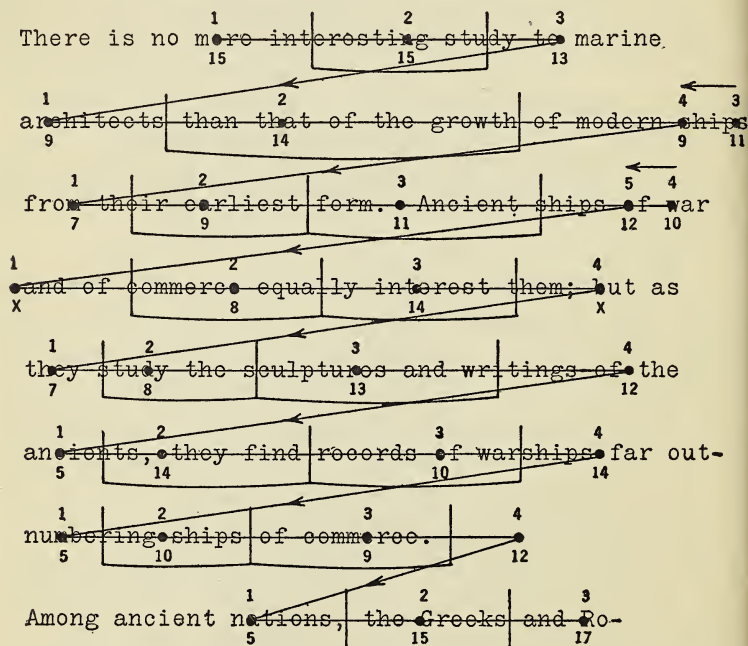


FIG. 3.—Eye movements of an adult, reading silently. (O'Brien.⁷)

The first is the record of an adult reading silently; the second shows the recording of the same adult reading the same passage aloud. Since the silent reading occurred first, the individual was already familiar with the passage before his oral reading began. The records for the two trials are summarized in the following table:

	SILENT READING	ORAL READING
average fixations per line	3.87	6.0
average regressions per line .....	.25	.75
average length of fixations	10/25 of sec.	14/25 of sec.
average width of span	13.7 spaces	9.5 spaces
total reading time for page	12.5 seconds	26.4 seconds

The oral reading required a third more fixations and three times as many regressions as the silent, in spite of the familiarity of the passage. The fixations were

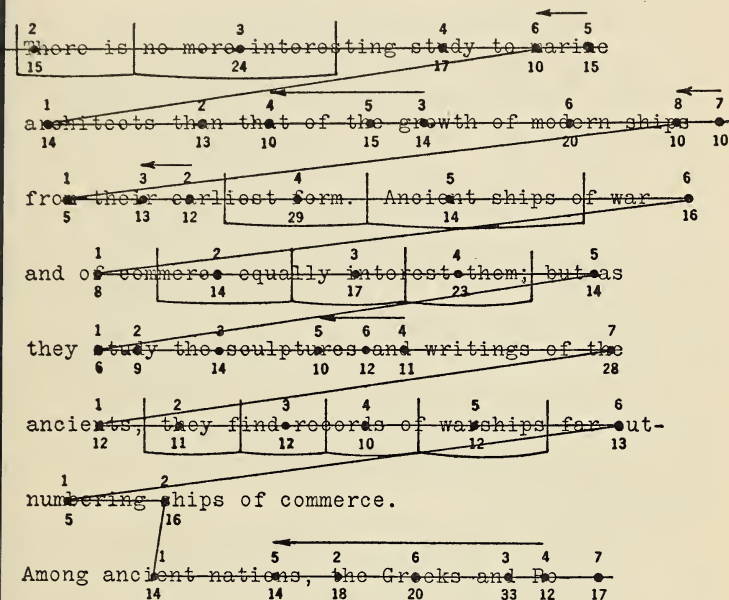


FIG. 4.—Eye movements of the same adult, reading orally. (O'Brien.⁷)

early half again as long. The oral span was only 50 per cent as wide as the silent. The total reading time was over twice as long. In other words, oral reading is characterized by frequent long pauses and many regressions, while silent reading shows few, short fixations and almost no regressions. The two processes

are therefore the *precise reverse* of each other. As a means of teaching efficient silent reading no worse method could be devised than to train children to be efficient oral readers. No child is likely to learn to make infrequent short pauses with no regressions or vocalizing by means of making frequent long pauses with many regressions and complete vocalization. Training in oral reading produces good oral readers—and nothing else.

The oral reader is slow because he must retard his eyes in order to keep them from getting ahead of his voice. The eyes can read words approximately four times as fast as the vocal apparatus can pronounce them. If the oral reader's eyes stayed exactly with his voice, he would have as many fixations as there were syllables on a line, because the unit of pronunciation is the syllable. Since the eyes almost inevitably move too fast, they get ahead of his voice once or twice on every line. He must then bring them back to the word he is pronouncing—thus causing a regression. Oral reading involves, of course, complete vocalization of every word, while silent reading does not require any vocalization at all.

In the first half-year of school, a pupil's fixations are so numerous and the focusing of his eyes so inaccurate that his silent reading is no more rapid than his oral. Moreover, he has a tendency to vocalize words—that is, to pronounce them—whether reading aloud or to himself. The initial stages of reading are, therefore, more or less oral, no matter how the children are taught. By the second grade, however, the eyes can move about twice as fast as the voice. If the children continue to receive intensive drill in oral

reading, they develop the eye-movements and the pronouncing habits necessary for reading aloud. By the third or fourth grade these children have a good deal of silent reading to do in the preparation of their lessons. Since their whispering is annoying, the teacher usually succeeds in suppressing it. If she is conscious of the problem involved, she also suppresses most of the lip movement. The matter usually rests at that point. The eye movements, because they are not visible to the teacher, remain essentially those that accompanied reading aloud. The young oral reader is trained during his first two or three years in school to make short jumps and many of them, and to pronounce each word. In the upper grades he continues doing exactly this, only without noise. Consequently, he is a slow reader and shows the characteristically low comprehension of the person whose speed is inadequate. For these various reasons oral reading should be avoided as much as possible, except at the very beginning. It is useful occasionally for testing purposes. There is, of course, no objection to oral training in the study of words. Word study is not, however, connected reading. The complete pronunciation of a new word appears to be necessary if it is to be learned, but the complete enunciation of every word in a story is wholly unnecessary for comprehension.

VOCALIZATION

The term *vocalization* refers to any movement of the lips, tongue, or vocal cords. These movements vary all the way from complete pronunciation of every word to a tiny vibration in the throat; this latter is still present in even the best silent reading. Regard-

less of the method by which a small child learns to read he will at first vocalize to a noticeable extent. The pronunciation of a word is not merely a help in memorizing; if the word is within a child's own speaking vocabulary, he can identify it by its sound. Vocalization is, indeed, a pupil's chief method for getting hold of new words. As he learns to recognize more and more words by their appearance without their sound, he will gradually drop off his speech reactions because they are no longer necessary, unless his spontaneous pronunciation is reinforced by continued drill in oral reading. Anyone, whether child or adult, almost inevitably vocalizes a completely strange word, but a child who has been properly trained in silent reading does not set his speech organs in motion when he is reading familiar material. The less enunciation there is, the better, because vocalization is related inversely to speed.

Use of the voice should, then, be stressed as little as possible—except in word study—for three reasons. First, it slows down the rate markedly, because words can be pronounced about one-fourth as fast as they can be read by the eyes alone. Second, it develops habits of excessive fixation and frequent regression, because the eyes constantly get ahead of the voice. Finally, it interferes with meaning because the unit of pronunciation is a syllable, whereas the unit of meaning, at the very least, is a whole word and is usually a phrase. Complete vocalization often produces more fixations per line than there are words. It keeps the eyes from seeing such a phrase as "my little sister" as a whole because it consists of five separate units of speech, although it is a single unit of meaning. By causing slow and piecemeal reading and by obtrud-

g itself into the reader's attention, vocalization interferes with comprehension.

WORD-FOR-WORD READING

The habit of looking at each word separately may be caused either by excessive training in oral reading or by a too-conscientious attention to details. Some children get the idea that they must look at every word; to omit one would be a sin. Whatever the cause, the habit of plodding word-by-word across a line of print is wholly unnecessary. In the beginning, first-grade children usually do read in exactly this manner. Every word is more or less unfamiliar, and a pupil has no background of experience that can supply any word he fails to see. He must therefore look at every word enough times to recognize it. Soon, however, he could begin to supply words from the context. As soon as he knows that nouns are preceded by the article "the," he can supply this article from experience without looking at it. As soon as he knows that the phrase "not only" will soon be followed by "but also," he can "think" these words without reading them. The good reader can proceed by phrases, not only because he has a wide reading span but because he omits many words, supplying them instead from his previous experience. By the second grade a child will begin to leave out words spontaneously, unless the teacher is insistent that he must read all of them. To be sure, an occasional careless child has to be cautioned to omit no words, but in general children tend to read too many words in a sentence rather than too few.

Word-for-word reading is objectionable, not merely because it is slow, but because it inevitably

interferes with the acquisition of meaning. Thus the words "in," "the," and "house" each have meanings of their own, but the phrase "in the house" has more meaning than the single words. In this particular instance the meaning of the phrase is the sum total of the meanings of the separate words. There are, however, plenty of phrases whose meaning is not a mere summation of the individual meanings which compose them. Such phrases as "through thick and thin" or "at sixes and sevens" must be read as units or their meaning cannot be understood. Children can learn, by the second grade, to recognize phrases and to read many of them as units. The sooner they achieve this habit, the better—both for their speed and for their comprehension.

S U M M A R Y

Slow reading may, then, have one or more of three main causes. It may be due to inefficient eye movements, to excessive vocalization, or to word-for-word reading. These three causes are, of course, interrelated. A child who reads every word as a unit must have many fixations, and he has time to vocalize if he wants to. Excess vocalization leads also to many fixations, and the pupil tends to read syllable-by-syllable—which is even worse than word-for-word. The child with too many fixations usually vocalizes, and the largest unit he sees at once is a word. In general, the three bad habits go together, and it is often impossible to tell for any given child which habit came first, or if all three developed together. From a remedial point of view the chronological sequence does not make much difference.

The typical slow reader is not the victim of a

single bad habit, but the possessor of an unfortunate system of habits, each of which reinforces the other. The whole performance is inefficient because it is clumsy and time-consuming. Even if a child becomes as adept as possible with this technique, he never gets the degree of comprehension by which his efforts could be rewarded, because his technique breaks up reading matter into tiny and meaningless units.

Good reading is characterized from the second half of the first grade onward by few fixations, few regressions, accurate hitting of a new line, rhythmic movements, little or no vocalizing, and a wide reading span. This method of reading is not a characteristic of any adult method that can be achieved only after one has grown up. It is merely an alternative method to that used by the slow reader. Any child of normal intelligence can develop either method, depending upon how he is taught. A child who has already acquired one method can learn the other, provided he is given the appropriate drill. The good reader has an efficient combination of muscular habits which function automatically and rhythmically. As a consequence, his attention is free to concentrate upon meaning. There is no reason why better teaching in reading should not develop a greater proportion of children into good readers with good habits from the first. A few pupils will probably always start wrong, but by adequate analysis and remedial work even the child who has made a bad beginning may be re-educated and changed from a slow, plodding, inefficient performer to a good and efficient reader.

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VI

DIAGNOSIS OF THE CAUSES OF SLOW READING

As has already been shown, a child may read slowly because he vocalizes, because his eye movements are long, or because he reads word-for-word. It is therefore necessary for the teacher to know how to analyze errors of procedure in all three respects.

DIAGNOSIS OF VOCALIZATION

As already pointed out, the rate of reading correlates directly with the extent to which the pupil pronounces the words to himself. There are two simple ways of determining the degree of this vocalization.

1. *Timing the Reader:* To use the first method, the teacher should select two unread stories, each at least three pages long. The child reads the first page of the first story to himself at his own rate, no record being kept of the time. It is necessary to let him get started on the story before his reading is timed, because anyone's start is always abnormally slow. When the pupil reaches the top of the second page, the teacher tells him to begin reading aloud; she times him for the length of the page. He then continues at once with the third page, reading it to himself, while the teacher again times him. A single measure of this sort is not enough, because it is unusual for two consecutive pages in a story to be of absolutely the same

difficulty and because children do not read all pages with equal efficiency, even when they are using the same method throughout. There are some children who become tired so quickly that the third page is read at either an abnormally fast or abnormally slow rate. Other children become more and more interested in the story as they go along; the third page has, for them, an advantage over the second. Because of the variations from page to page and child to child, the teacher should use a second story. As before, she allows the pupil to read the first page to himself; she starts her timing at the top of the second page, which he reads silently. When he turns to the third page, he begins reading aloud, and is again timed. In this way the positions of the oral and silent reading are exchanged, and any advantage due to position for any child is eliminated. The teacher averages the time needed for the two oral readings and that needed for the two silent readings. If the pupil is not vocalizing at all, the silent reading will take approximately one-fourth as long as the oral. The more nearly the time for silent reading approaches that for oral, the more vocalization is taking place. If a child cannot read to himself at least three times as fast as he does orally, he vocalizes too much.

2. *Direct Observation*: A second type of investigation may be made by observing directly the amount of vocalization shown by a pupil. The child is told to read a story to himself. After he gets started, the teacher simply studies the amount of movement that is taking place in the speech mechanism. She can recognize five different levels of performance. These five degrees of vocalization are listed on page 71.

1. Loud whispering
2. Faint whispering
3. No sound, but more or less movement of the lips
4. No sound, no lip movement, but a clearly perceptible vibration of the vocal cords
5. No sound, no lip movement, no vibration

The loud or faint whispering and the lip movement can be observed without any special training. To determine the amount of vibration in the vocal cords, the teacher needs a little experience. She should first have a pupil read out loud, while she places her fingers on his throat. She will feel the vibration that accompanies speech. When the child begins to read silently, this vibration should cease. It is not, of course, completely eliminated. A precision instrument would record some vibration whenever a pupil is reading or thinking, but there should not be enough to be felt by the fingers. If there is no marked change in the amount of vibration as soon as the silent reading starts, the pupil is still moving the inner parts of his vocal apparatus, even though he may have stopped moving his lips. If the pupil makes no sound, does not move his lips, and has no observable vibration, he is not vocalizing sufficiently to interfere with the development of a normal reading rate. Any greater degree of pronunciation will, however, slow down the reading process.

DIAGNOSIS OF ERRORS IN EYE MOVEMENT

The equipment needed for a complete and scientific investigation of eye movements is expensive and technical. The classroom teacher does not, however,

need to make a scientifically accurate determination. For her purposes a much simpler method of investigation is entirely adequate. The teacher needs merely a small mirror, about the size of the page in an ordinary book. When she wishes to study the eye movements of a child, she asks him to read silently from any book appropriate to his age and grade. He sits at his desk with the book in a fairly upright position on the desk. While he reads from the left-hand page he holds the mirror against the right-hand one; as soon as he is ready to read from the right side, he places the mirror against the left. The teacher stands behind him and looks over his shoulder at the reflection of his eyes in the mirror. It is possible to dispense even with the mirror and to watch a child's eyes directly by sitting down on the floor in front of him and looking up under his lids. This position is not particularly comfortable and is often not efficient because the pupil is inclined to look at the teacher instead of at the book. It is practically impossible for two pupils to watch each other's eyes by this direct method because they look continually at each other, and one or both is certain to get the giggles. A good enough mirror costs ten or fifteen cents and provides an impersonal medium between teacher and pupil or between two pupils.

1. *Number of Fixations*: The teacher should count first the number of pauses per line. When anyone first tries to count eye movements, he or she usually sees very little. The initial use of any kind of technical equipment is equally disappointing. The first time one listens through a stethoscope he hears only some loud noises; when one first looks through an ophthalmoscope, he sees chiefly a blurred light and a few spots. The teacher should therefore not be discouraged if

cannot, during her first attempt, see all the movements. The mirror is, however, a simple technical instrument; a teacher should require not more than a few trials before she can see eye movements with sufficient accuracy for practical purposes.⁵

No one can count the fixations on every line accurately. The proper procedure is for the teacher to count what lines she can, noting down the number of fixations on each line she succeeds in observing completely, until she has counted ten lines. Whenever she misses the start of a line or makes a mistake in counting, she should simply wait until the pupil begins another line, and start over again. The long return sweep is the signal that tells when a new line is about to be begun. In order to get ten complete lines, it is usually necessary to let a pupil read twenty-five to thirty. When one is counting fixations, one counts every pause, no matter whether the eye has just moved to the left or to the right. After the teacher has counted and recorded the number of fixations on *any* *complete lines*, she adds up the total, and divides it by ten to obtain a statement of the average number of fixations per line.

After her initial efforts a teacher is able to count accurately whenever there are three, four, or five fixations on a line. If the child's eyes stop oftener, the chances are that she will miss some of the pauses. Certainly, if he has over ten fixations per line, she will miss many of them, because the eye movements are so small, so fast, and so frequent that she cannot see and record them all. For an exact scientific determination this failure to count accurately is, of course, fatal, but for practical purposes it is of no importance. It does not make any difference whether a child has eight

fixations a line or eighteen or twenty-eight; any number above five is too many. If there are five or less the teacher can count them; if there are so many she cannot count them, then they are too numerous. For guidance in remedial work, the question of how many superfluous fixations a child makes is of purely academic interest.

2. *Number of Regressions*: When a teacher has determined the average number of fixations per line she is ready to find out how often the child's eyes regress. As noted above, she should disregard regressions during her investigation thus far. When she is determining the number of regressions, she should pay no attention to any forward movements of the eye. As long as the child's eyes are jumping from left to right along a line she does not count at all. Any movement from right to left, except for the long return sweep from the end of one line to the beginning of the next, is to be counted. Again, she will be unable to count every single line, but she should continue trying until she has recorded the regressions on any ten lines. If a pupil has made one or more regressions on a given line, she of course records the correct number. If she has seen his eye movements throughout the length of a line and he has made no regressions, she records a zero. In counting regressions the teacher must be sure to include *any line correctly counted*, whether it contained a regression or not; that is, she must include the zero lines. She then adds up the total number of regressions for the ten lines, divides the total by ten, and thus determines the average number per line.

3. *Length of Fixation*: There is no simple way of measuring the length of the pauses, nor is there much practical value in so doing. The length of the fixations

indicates the amount of time needed for a stimulus acting upon the eye to be perceived by the brain. In other words, it is a function of the nervous system. It differs from one person to another because some nervous systems apparently transmit impulses faster than others, but it is fairly constant for the same person. Efforts to cut down the length of the fixations have thus far been unsuccessful, and there seems no good reasons why a teacher should take time to measure a characteristic that she cannot appreciably alter.

4. *Hitting the Beginning of a Line:* As pointed out in the previous chapter some children have considerable difficulty in locating the beginning of a new line; their return sweep either carries them too far out into the margin or else not far enough. When the teacher has counted the fixations and regressions, she is ready to determine the accuracy with which a child starts a new line. In making this investigation she disregards everything except the beginning of each line of print. If she misses the start, she simply waits for the next return sweep and tries again. If a child swings his eyes from the end of one line to the beginning of the next and at once starts reading across the page, without hesitation and without regressions, he has obviously hit the beginning of the new line accurately enough. If his eyes jump about, first to the right and then to the left, or if he starts a line with one or more regressive movements, it is evident that he did not immediately find the first word. The teacher records what happens at the beginning of any ten lines that she has clearly seen. If there are no extra movements she records a minus; if there are any extra movements at all, before the regular progress across the page begins, she records a plus. She need not count

the extra movements, since their number is of no importance; a single wasted fixation means an inaccurate start. The teacher thus records the results for any ten lines. By adding a zero to the number of plus signs she will have an approximation of what per cent of lines are begun inaccurately. As with the other determinations, she will probably need to let a child read at least twenty lines in order to see accurately the beginning of any ten.

5. *A Few Hints concerning Procedure:* As the pupil reads lower and lower on the page, his lids gradually obscure the eye movements. The teacher may either allow him to read the lower third of the page to himself without making any effort to count, or she can stop him as soon as his lids cover his eyes and tell him to begin on the next page. In this case, however, she should not count the first few lines, because he will need a little time to get back into the meaning of the story. In fact, the first two lines on the new page should never be counted.

Naturally a teacher cannot take the time to count eye movements for every pupil in the room. Before analyzing the reactions of her poorest readers, it is a good idea for her to practice on a few good readers, so that she can see what the movements look like when a child is proceeding efficiently. A rapid reader has few forward movements and very few regressions to count; consequently, observation and recording are simpler than for an inefficient performer. When a teacher has developed her own skill in the use of the mirror, she should select from the class those pupils whose rate is abnormally slow and should limit her diagnostic investigations to this relatively small number.

WORD-FOR-WORD READING

It is somewhat more difficult to determine the tendency of a child to read each word separately instead of grouping them into phrases. It can, however, be done in either of two ways. Neither is especially difficult, although the first requires training and experience on the part of the teacher.

1. *Use of the Mirror:* The teacher should first select an unread story printed in a size of type that will have not more than eight or nine words to a line. This number of words will give a pupil an opportunity to group words into phrases if he is in the habit of doing so. If, on the other hand, he is reading word-for-word he will not have so many fixations that they cannot be counted. The teacher first arranges the mirror as she does when counting eye movements; she then counts the fixations for any ten lines that she is able to record with accuracy. Regressions are counted as well as forward movements. If the pupil is not grouping the words at all, his number of fixations per line will be at least equal to the number of words; that is, if there are eight words on a line he will have eight or more fixations. When the teacher has succeeded in counting ten lines, she should add up the total, and divide by ten as for previous determinations. Since she will inevitably miss a fixation once in a while in her counting, any number that approaches the average number of words per line is an indication of word-for-word reading. If a child has about half as many fixations as there are words, he is grouping some of them together. If he has only a third as many, he is reading consistently by phrases.

2. *Use of Flash Cards*: If a teacher has trouble in counting the relatively large number of fixations shown by the word-for-word reader, she may use another method of procedure. She needs to have about fifteen flash cards (5" by 3"), on each of which she has typed a phrase consisting of four short, easy words. The phrase "at the old mill" is an example. The pupil sits on one side of a table, the teacher on the other. The flash cards should be placed in a pile, face down, on the teacher's side of the desk. She holds a piece of cardboard, considerably larger than the cards, between herself and the pupil, so that he cannot see any card while she is getting it into position behind the cardboard screen. She tells the pupil he will see a card with some words on it when she removes the cardboard for a second—just long enough for him to get one look at the words. He is to tell her what he sees. The first flash card should then be held behind the screen at approximately the angle and distance from the pupil's eyes that are normal for a book held by the child himself. The teacher then lifts and immediately replaces the cardboard, exposing the flash card for as brief a time as possible. It is essential that the flash card itself should not move. If it does, the pupil will see nothing; what moves is the cardboard screen. The first three or four cards are to be used as examples to train the pupil in what he is supposed to see. They are therefore not recorded. When the pupil understands what is expected of him, the teacher starts the real investigation. She exposes the first card for one-fifth of a second * and asks the pupil to tell her what words he saw. If he did not see all four words, she

* If the cardboard is moved aside and instantly replaced, in one continuous motion, the time exposure will be about one-fifth of a second.

exposes the same card a second time and again asks him what he saw. She continues exposing the card as many times as necessary for the pupil to see all the words. Even good readers sometimes need more than one exposure for isolated phrases, but they usually do not. A typical word-by-word reader needs as many exposures as there are words—sometimes more. When a teacher has shown any ten cards as many times as necessary for the child to read each, she should add up the total number of exposures and divide by ten. If the resulting average per card is less than one and a half, the child is reading by phrases. If it is between one and a half and two and a half, he is reading much of the time by words but occasionally by phrases. If it is over two and a half, he is reading most of the time by words. Any average above three is a sure sign of word-for-word reading.

OTHER RESULTS OF DIAGNOSIS

After a teacher has used the mirror technique a few times, she begins to discover other interesting points about the reading habits of particular children. She finds an occasional pupil who has never learned to proceed in an orderly manner across any line of print. His eyes jump about all over the page. For some reason he failed to grasp, in the first grade, the idea that words were supposed to be taken in a particular order. Consequently he wanders about in a hit-or-miss fashion. If asked to tell what he has read, he will often produce a tale which contains many of the words used in the book but is not an accurate summary; that is, he takes words here and there from the pages he has read, supplies such details as his imagination suggests, and emerges with a story—but not the right one.

In the lower grades a teacher sometimes finds a child whose reading seems alternately clear and confused. He understands some points in a passage, but he misses others that seem no more difficult. When she watches his eye movements, she may find that he uses the laborsaving device of reading every other line in the reverse direction. He travels across the first line from left to right, the second from right to left, the third again from left to right, and so on. Children are not born with the habit of reading in any direction more than in any other. For an adult, a movement from left to right is a purely automatic procedure; therefore first-grade teachers sometimes fail to explain the matter. An occasional child either has difficulty in making the long return sweep to the beginning of a new line or else never gets in the habit of making it. He consequently reverses some of his lines. His comprehension is accordingly piecemeal. This bad habit shows up markedly when one observes the pupil's eye movements in a mirror.

Sometimes a pupil shows the results of a certain "crutch," often used in the first grade. A primary teacher soon finds out that children have difficulty in finding where a new line starts. They come back to the beginning of the same line, or the one above or the second one below, quite as often as they come back to the immediately following line. She may therefore train the children to follow each line with their fingers; then, when they reach the end, they first bring their fingers immediately down to the next line and then follow it with their fingers back toward the left. By this means they go around two sides of a right triangle, instead of coming back along the hypotenuse. Other

Teachers bring about much the same result by having the pupils keep a ruler under each line as they read. The overt habits with the finger or ruler are soon lost. What are not lost, however, are the accompanying eye movements. Many a child in the fourth or fifth grade will bring his eyes directly down to a new line and then follow it to the left instead of making the quicker motion along the diagonal. If a child has this bad habit he wastes about one-fifth of a second in getting from each line to the next. This amount of wasted time may not seem enough to be of any importance, but it soon mounts up; at the end of a three-hundred-page book the wasted time is considerable.

Some years ago the writer was asked to give a course in remedial reading for a group of adults who wanted help. Most of the people turned out to be foreigners. Among them were eight adults of different nationalities, all of whom showed the same bad habit. Each of these dropped his eyes from the end of every line of print to the end of the next line and then slid his eyes back toward the left until he reached the beginning of the new line. It seemed strange that people of such varying nationalities should make this one error. Upon investigation it appeared that every one of these persons had been taught—although at different times and without knowing each other—in the same night school by the same teacher, who had trained them to get from the end of one line to the beginning of the next in this way. In the same group there were three Germans who had been in America from two to fourteen years. All three of them showed the peculiarity of eye movement. When asked to read the sentence, "The man, whom I have never become acquainted with before, is his brother," they read the words in the following order: "The man whom I never

before became acquainted with have is his brother." This sentence is an exact parallel of its German equivalent, "Der Mann, den ich nie früher kennen gelernt habe, ist sein Bruder." Even after as long as fourteen years of hearing, writing, and speaking English, these people were still skipping over the subordinate verbs and rearranging the adverbs into the order to which they had been accustomed in their own language, and this habit of transposition showed in their eye movements. There were also eleven Chinese in the class. All of them were old enough to have learned to read their native language in vertical columns. Upon closer study it appeared that not one of these eleven men moved his eyes appreciably. Each moved his head in short jerks from left to right. They reported that movements of the eyes up and down the columns of Chinese figures were so tiring that educated people moved their heads and kept their eyes quiet. Both the Chinese and the Germans had simply carried over into English the basic habits of their own language.

One more habit, not necessarily associated with slow reading, is observable by the use of the mirror. Some children develop very early one of two unfortunate methods of dealing with unfamiliar words. The commoner of these is simply to skip any word not immediately recognized. Other pupils, who are apparently too conscientious to jump over a new word, develop the habit of wandering back and forth within it, reading and rereading the words on either side of it, and glancing aimlessly up and down the page until they have completely lost the thread of the story. Both these habits are reflected clearly in the mirror. If the teacher gives a pupil a piece of reading material that she knows contains a few unfamiliar words, she can observe what the child does when he comes to them.

Either of the bad habits just described will prevent the development of an adequate vocabulary.

S U M M A R Y

By the simple procedures described above a teacher can investigate a pupil's eye movements, the degree of his vocalization, and his tendency to read word-for-word. She needs no complicated apparatus, nor does she require a long period of training before she can get sufficiently accurate results. She can carry on her diagnostic work during the reading period, provided she uses some such procedure as that described below to keep all members of the class profitably occupied. She first starts the whole class upon the reading of some reasonably interesting story, warning them that any one of them may be called upon to tell any part of the story after they have finished it. The story should be long enough to keep the class busy for at least twenty minutes, and preferably a half hour. When the pupils have finished, she calls upon them at random, having the first one start the retelling of the story; the second continues from where the first left off, and so on, until the story has been retold orally. After this sort of assignment has been used once or twice, all the children know that they have to read carefully enough to remember all parts of the story, since they may be called upon to reproduce orally before the class any section of it. The pupils will therefore put their attention on what they are doing, thus leaving the teacher free to diagnose the particular difficulties of a single pupil.

She should each day select one child and run through the *entire diagnostic procedure* outlined

above, while the rest of the class is reading. She is not likely to have more than a dozen pupils in her room for whom this diagnostic approach is necessary. After the first trial she will need about ten minutes to determine the average number of fixations and regressions per line, and the accuracy with which a new line is begun. She needs not more than three or four minutes to estimate the degree of vocalization. Another ten minutes is sufficient for determining the extent to which the pupil groups words into phrases. She can, then, during one reading period make an adequate diagnosis of the mechanical faults of a single pupil. She will probably not wish to do this type of work every day; if, at the start of a new semester, she uses two or three such periods a week, she will be ready before the end of the first month to begin remedial work with those pupils who need it. The use of remedial training for pupils who do not require it is wasteful. The materials used in much of this work are only moderately interesting and are certainly less valuable than the books a good reader might be reading in the same amount of time he wastes on exercises he does not need. It is therefore desirable that the teacher find out as soon as she can in the school year which children need what type of treatment.

If a teacher is fortunate enough to be in a school system in which she remains with the same group of children through two or three years of school work, she will save herself much time and effort and will achieve far better results if she will spend the first two or three months of her acquaintance with each class in making a complete diagnosis of each child's procedure in reading not only in speed but also in vocabulary and comprehension. She can then make for

each child a plan of procedure to guide both him and herself through the next year or more of his work. Without such diagnosis, the progress made by an inefficient reader is either slow or nonexistent; it is the already-proficient reader who learns by general training. Ordinary teaching merely provides practice in habits previously formed; it does not diagnose. Practice perfects only the particular reactions being practiced. If they are bad habits, they will be perfected with all their shortcomings. The nervous system has no preference whatever for good habits over bad. In a given amount of time it will bring the worst possible habit to just as high a stage of perfection as the best possible habit. General drill and practice are therefore helpful to the good, and fatal to the inefficient, reader. It is the widespread use of general practice, with the consequent neglect of diagnosis, that produces the ever-increasing variability demonstrated in an earlier chapter. The children who get off to a good start profit more and more by the general training they get, because what they practice is correct; those who failed to get properly started profit less and less, because what they practice is wrong, and the more adept they become the worse they read. No teacher should proceed with the instruction of a new group of children until she has made an adequate diagnosis of their reading habits.

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VII

REMEDIAL EXERCISES FOR INCREASING THE SPEED OF READING

It has already been pointed out that children may be slow readers for a variety of different reasons having to do with technical deficiencies. Two other, and more general, causes of slow reading should be added to the list. Some children have read so little that they are inefficient and awkward. Others have no interest in reading and consequently make little or no effort to progress. Pupils who fall into either of these two groups may show no technical deficiencies. The treatment of children who are simply inexperienced consists, of course, in giving them a great deal of easy reading matter and in pushing them through it at as rapid a rate as is consistent with their comprehension. For pupils of the second type it is necessary for the teacher to find some kind of reading matter that is easy and concerns a topic that is interesting. If one has studied a slow reader's eye movements, investigated his vocalization, and determined his ability to read phrases and has not discovered any serious defect, he almost certainly belongs to one of the two groups just mentioned. He can read correctly, but he either does not or will not. The teacher's problem then becomes one of motivation and adjustment of reading material to the individual child in question. He has no need for specially devised drills. The types

of exercise to be presented below should be used to remedy only such deficiencies as are revealed by the diagnosis described in the previous chapter. The teacher should not use her own time or that of a pupil by administering these exercises unless the child has those definite defects that the exercises are designed to remedy. They do not constitute a form of general drill and are certainly not intended for use by the entire class.

Slow reading, as revealed by diagnosis, is due to vocalization, inefficient eye movements, or word-for-word reading. The exercises described below have been devised to remedy the characteristic defects arising from these specific causes. They will therefore be presented in three separate groups according to their nature. It is best to use them in the order in which they appear, since each series of exercises builds up habits that serve as a basis for the next. The teacher should therefore begin with the vocalizers and work with them as a group for as long as seems to be necessary. Then she should assemble a new group, including any appropriate members from the former one, and proceed with drills in correct eye movement. The elimination of vocalizing automatically cuts down the number of fixations; if vocalizing is not eliminated first, the fixations will remain numerous in spite of remedial drills devised to decrease the number. Finally, the teacher should make up a third group of those children who read word-for-word. Many pupils who would have needed this drill badly at the start of the training may not require it at all after they have completed the earlier sections of the work. If the exercises are applied in the recommended order they will

be found to reinforce one another to the greatest possible extent.

A PROGRAM FOR DECREASING VOCALIZATION

There are essentially three methods for bringing about a decrease in the inner speech that sometimes accompanies reading. The first (1), and by far the simplest, is to render the speech mechanism incapable of pronouncing words, even partially. A simple and effective means of bringing about this result is to have the child put two fingers into his mouth, using them to separate his upper and lower teeth and to hold down his tongue. Nobody can articulate words with his mouth hanging open. If the child, through force of habit, moves his jaws to articulate, he bites his fingers. With the tongue and the jaws both out of commission, there will be no pronunciation. Instead of his fingers a child may use his ruler or a large-sized eraser. The fingers are better than either wood or rubber, however, partly because the pupil is unwilling to bite them and partly because he always has them with him! Another, if even less elegant procedure, is to let the child chew gum while he is reading. His speech mechanism is out of commission, not because it is at rest but because it is doing something else. No one can pronounce words and chew gum simultaneously. Naturally, a pupil should not persist in these techniques until they become habits. They should be used only until the tendency to pronounce words has been broken.

John was a loud vocalizer. Whatever else might be wrong with him, it was evident at once to the teacher of the remedial class that something must be done to

stop the noise John made, if the other children were to get their work done. Without waiting to make any analysis, Miss A. promptly recommended the finger-in-the-mouth technique. There ensued a silence—but almost no comprehension of the reading matter. John seemed unable to recognize even the simplest words unless he could pronounce them. In order to find something that John could read without vocalizing, it was necessary to use a second-grade book. During the first week John had his doubts about the value of this method but agreed to give it a fair trial. Before the end of the second week he had begun to feel that his reading was much less labored than ever before. Instead of being work, the simple book he was using became play. At about this time the boy appeared one morning with a neatly whittled and sandpapered piece of wood, all wrapped up in a clean handkerchief. During the following six weeks John kept the piece of wood between his teeth whenever he was reading. No other treatment was used for this boy. Yet in two months' time he improved nearly three years in speed and over a year in comprehension. Moreover, he reported a great increase in the ease with which he read. After leaving the class, John continued to carry the wood around with him, but he used it less and less. At the end of the year he was reading without any artificial aid to keep him from vocalizing.

A second (2) and less direct way of eliminating inner speech is to give a pupil a large amount of reading matter that is very easy, very interesting, and very unimportant. The material used must be easy, because unfamiliar words lower both rate and interest. No one can read rapidly if new words appear on every other line, and it is not advisable to let a child develop the habit of skipping them. The level of difficulty

should be at least two grades below that in which a pupil is at the moment placed. The material used must be interesting, not only to motivate the child into reading the material at all, but also to push him through it at the greatest possible rate because he is anxious to reach the end. The material must be unimportant because no sensible pupil is going to rush at breakneck speed through an assignment he knows he will be examined on in detail. In short, the reading material for such remedial work must be simple, exciting, and worthless.

For older pupils the best "literature" for the purpose is not found in the school library, which contains chiefly textbooks in reading and worth-while stories. The former are usually lacking in interest and the latter are usually too hard. No regular school assignment will do at all, because it is too important. The best materials are the magazines of Western stories, detective stories, adventure stories, and so on. The books of cartoons of "Little Orphan Annie" or "Mickey Mouse," available at Woolworths, are also excellent. None of this material is worth reading, none of it is part of any school assignment, all of it is easy, and all of it seems to hold great fascination for the childish mind. Many children who will plod—if at all—only slowly and grudgingly through ten pages of a second-grade reader will, in the same amount of time, finish a cowboy story twenty pages long. The teacher may not approve of this worthless and unliterary type of reading matter. Its value lies, however, in the very characteristics which arouse her scorn. No literate adult has a high opinion of, for instance, the Tarzan stories, but it is better that a child should read willingly and happily the nonsensical adventures of Tar-

zan than that he should either not read at all or conceive the idea that all reading is a frightful bore. He will outgrow Tarzan, with aid from no one but Mother Nature, but he will be lucky if he ever outgrows an early dislike for reading.

It is not to be supposed that a child should continue indefinitely with such worthless stories. They are valuable only in the early periods of developing speed and decreasing vocalization. When a child can read magazines of the type indicated as fast as the average for his grade and with reasonable comprehension, his teacher should introduce him to reading matter of greater literary value. Even then, however, she must guard against assigning stories that are hard or uninteresting. Especially should she avoid giving the pupil a long book. Little stories of twenty pages are long enough. Until a child becomes a proficient and rapid reader, he is discouraged by the mere size of a big book, no matter how interesting the contents may be.

As soon as the pupil begins to read the first stories given him, he should be pushed to cover them as rapidly as possible. It is obvious that a rapid reader cannot vocalize, because pronunciation of the words takes too long. As a child reads more and more stories under pressure, he will gradually vocalize less and less. At first he will not get much meaning from what he reads, but this stage does not usually last more than two or three weeks. The teacher should expect this loss of comprehension and should not allow either herself or the pupil to be worried by it. Comprehension will return, not only to its former level but to a higher one, as soon as the vocalization has been eliminated.

The third (3) type of training—which is essentially a special form of the second—requires the prep-

ration of some exercises such as that to be presented shortly. These exercises are usually mimeographed or typed upon a single standard-size page. They should be so constructed that each page contains connected reading matter approximately 350 words long; at the bottom of the page are five or six questions about the content. The pupil is given the sheet face down. At a given signal he turns the paper over and starts reading. The teacher gives him a definite time limit. For the third grade this time limit is $3\frac{1}{2}$ minutes; for the fourth grade, it is $2\frac{1}{6}$ minutes; for the fifth grade, $2\frac{3}{4}$ minutes; for the sixth, $1\frac{1}{2}$ minutes; for the seventh, $1\frac{1}{3}$ minutes; for the eighth, $1\frac{1}{4}$; for the ninth, $1\frac{1}{6}$. These speed limits require a reading below the average for the respective grades because the "warming-up" period is included; the start is always so slow that the normal reading time must be lowered for such a short selection. At the end of the allotted period the teacher takes away the exercise, whether the pupil has completed it or not, and asks him the questions about it.* She then gives him a second exercise, again timing him in the same way. A sample sheet appears below.

My father once found three little bears only a few weeks old in the woods. Some one had just shot their mother. The little bears were sitting beside their dead mother. They were too little to look after themselves, so my father thought he would bring them home. He picked up the littlest bear in his arms. The other two came along after him. When he reached home he fed them some warm milk. At first the little bears cried just like real people because they missed their mother

* Comprehension is good enough if all but one question is answered correctly or if all questions are answered almost right. It is not necessary for answers to be perfect.

so much. After a few days they forgot her and seemed to be very happy with us. Of course I loved all three of them. I played with them from morning till night. We would chase each other up and down the road and across the fields. Sometimes we would find some blueberries. Then the bears and I would all stop and eat as many as we wanted.

I gave each bear a name. The biggest one I called Jack and the littlest one I called Jim. The third bear I called Johnny. They were really my best friends, because my father and mother lived out in the woods a long way from any city. There were no children for me to play with. If I had not had the bears I should have been all alone. I used to talk to them all the time. Often I wished they could answer me. Even though they could not tell me so, I knew they loved me as much as I loved them.

The bears always wanted sweet things to eat. Every day I gave them some pieces of sugar. Even better than the sugar they liked all kinds of cake and candy. But best of all they liked honey.

1. What did the man find in the woods?
2. What did he do with them?
3. How did the bears show they missed their mother?
4. Was the child afraid of the bears?
5. Why did he play with them instead of with other children?
6. What things did the bears like to eat?

Two such exercises a day supply as much pressure as is desirable at one time. On the next day the teacher again has the pupil read two successive exercises in this fashion. At first he will not get more than part way through the exercises. His teacher should, of course, encourage him to read faster until he either

succeeds in finishing the exercises in the allotted time and with reasonable comprehension or makes as much progress as she feels he is capable of at the time. She can tell when the pressure for speed is too great because the comprehension becomes practically zero. If this stage is reached before the child can read fast enough to satisfy the standard for his grade, the teacher should abandon the exercises for the time being. This reading against time is extremely valuable, if administered in small doses. It helps in decreasing vocalization, because the child drops off more and more pronunciation in his hurry to finish an exercise on time.

There is, of course, no objection to a combination of these various techniques. A pupil can read either stories or exercises with his fingers in his mouth. If the teacher wishes to do so, she may determine the number of words in each story in several issues of such a magazine as *Western Stories* and use these selections for practice in reading under pressure. In this case she does not need to devise any special exercises. She needs merely to work out an appropriate time limit for each story. Thus, if a given story contains 3,368 words and the pupil reading it is in the fifth grade, he should be given $17\frac{1}{2}$ minutes. This time limit will force him to read at the average rate for his grade. A whole story is long enough to be uninfluenced by the slow "warming-up" period; the regular norms are therefore applicable. The time limit is, of course, different for each story because each has a different length. In an hour's time a teacher can prepare an issue of some magazine for use in reading against time. She first finds out how many lines contain a hundred words. She next determines the number

of lines per page. She then counts the number of pages per story and multiplies it by the number of lines per page, to get the total lines in the story. This total she divides by the number of lines necessary to print a hundred words. The resulting figure will tell her how many hundred words there are in the selection. This number is in turn divided by the words per minute necessary for reading up to standard for the grade. The final figure tells her how many minutes to allot for the story. A teacher is likely to need fifteen or even twenty minutes to determine the reading time for the first story, but the remaining ones should not take her more than five minutes apiece, because over half the original figuring applies to all the stories in a single issue of a magazine. One advantage of using a magazine is that the exercises are in permanent form and can be used in one class after another.

A PROGRAM FOR INCREASING THE EFFICIENCY OF EYE MOVEMENTS

Some teachers of remedial reading do not believe in explaining anything about eye movements to the children. They prefer to eliminate unnecessary fixations by the relatively indirect method of persuading the pupils to read faster; that is, they use exactly the program above described for decreasing vocalization. If a child is motivated by his interest to get through a story as fast as he can because he wants to reach the end, he will use as few fixations as possible. As he gets more and more interested in what he is reading the number of fixations is almost certain to decrease. This method of procedure is somewhat roundabout, although it is admittedly a general remedy for almost

all deficiencies of rate. In the first two or three grades it is probably the only method of procedure, because the pupils are not yet old enough to understand an explanation of mechanical details or to focus their eyes with sufficient accuracy to use the remedial exercises. At all levels beyond the fourth grade, however, children can profit by direct drill in correct eye movements. They can understand simple explanations, and they are old enough to control with reasonable accuracy the movements of their eyes across the page. Many of them use a dozen fixations per line merely because they do not know of any reason why they should not; they have no objection to using three or four if that number is more efficient.

The teacher does not need to give much of an explanation. She can merely tell the children that she is going to give them some exercises in moving their eyes correctly across the line of print. She may explain further that they usually waste time by looking at each line in too many different places and that she wants to train them in looking less frequently so that they may become more rapid readers. She should, of course, select for this explanation only those children who have been found by her previous diagnosis to have too many fixations per line.

The pupils are next divided into pairs. One pupil in each pair is to read the first exercise while the other watches his eye movements in a mirror. After one pupil has finished an exercise, the two change places; the first one then watches the eye movements of the second. It may seem that children in elementary school are not mature enough to watch each other in this way. As a matter of fact, they are highly accurate. Moreover, they get great enjoyment out of it and are

stricter with each other than any adult would dare to be. They watch each other intently and object strenuously to regressions. The use of the mirror is, then, not only possible but desirable for children who need remedial drill in eye movement.*

The first drill (1) consists simply of practice in moving the eyes across the page in an appropriate manner without the use of words. The exercise to be used appears below. The pupil who is reading is told to look at the first dot on the first line, then to slide his eyes along the line to the right until he comes to the second dot, look at it, and again slide his eyes to the right until he comes to the third dot. He then brings his eyes back, along the diagonal to the second line; he stops at each of the three crosses on this line and then brings his eyes back to the beginning of the third. He proceeds in this way down the page. It should be noted that the first figure is placed at a point some spaces in from the beginning of each line, while the third appears a little way in from the extreme right; that is, the fixation points are so arranged as to approximate the proper pauses of the eye in actual reading. The pupil who is watching is instructed to stop his partner whenever he sees more than three fixations on a line. Whenever the reader is stopped, he goes back to the beginning of the exercise and starts over again. This drill makes rather heavy demands upon the eyes. A pupil should not, therefore, work at it for more than five minutes. At the end of that time, whether or not he has succeeded in "reading" the entire page without a mistake, he should change places

* For any level above elementary school the students can practically train each other by this technique, with only general supervision by an instructor.

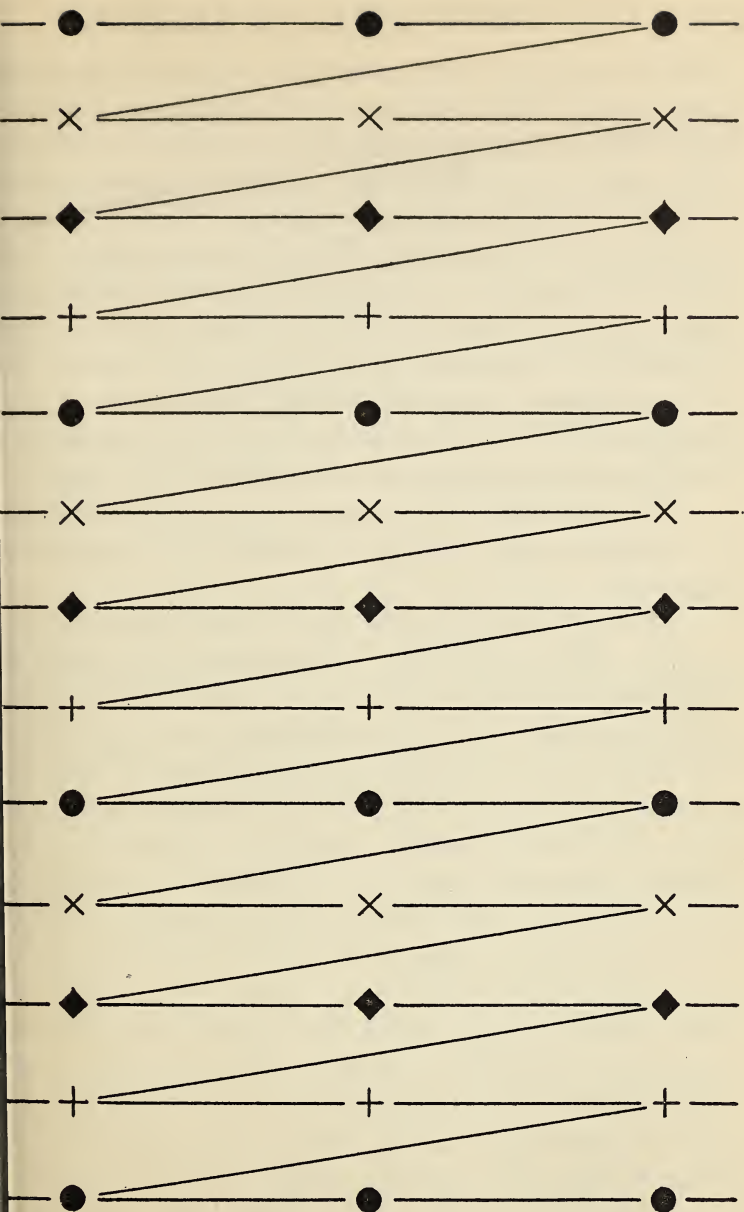


FIG. 5.—Eye-movement drill, No. 1 (dots).

with his partner. Two trials by each pupil are sufficient for one day's work. On the following day each pupil takes another two trials, continuing in this way until each can read the entire page without more than one or two errors. This final level of performance is the only one that need be checked by the teacher. This phase of the work requires not more than a week, and often not more than three days. At the end of a week it should be abandoned, even if the pupils are not yet perfect, because the initial interest in this new type of exercise has by that time disappeared and the exercise itself is too monotonous to be continued for long.

The next step (2) is to substitute actual words for the symbols. An exercise of this type appears on page 101.

The directions are the same as for the preceding exercise. The pupil is to read the first word, slide his eyes along the line to the second, then to the third, and then return along the diagonal to the next line. The child who is watching is instructed to stop his partner if he detects any extra fixations or regressions. Each pupil should work at this exercise for five minutes unless he succeeds in reading it correctly in a shorter time. The two then change places. If they have not read the page correctly, a second trial is permissible on the same day. Each day a different sheet will be needed, since the pupils will otherwise memorize the series of words. Five such sheets are sufficient, one for each day for one week. Some pupils will not need this number, but it is desirable to have them on hand. The change in the words from day to day breaks the monotony that is inevitable if the identical exercise is used throughout the week.

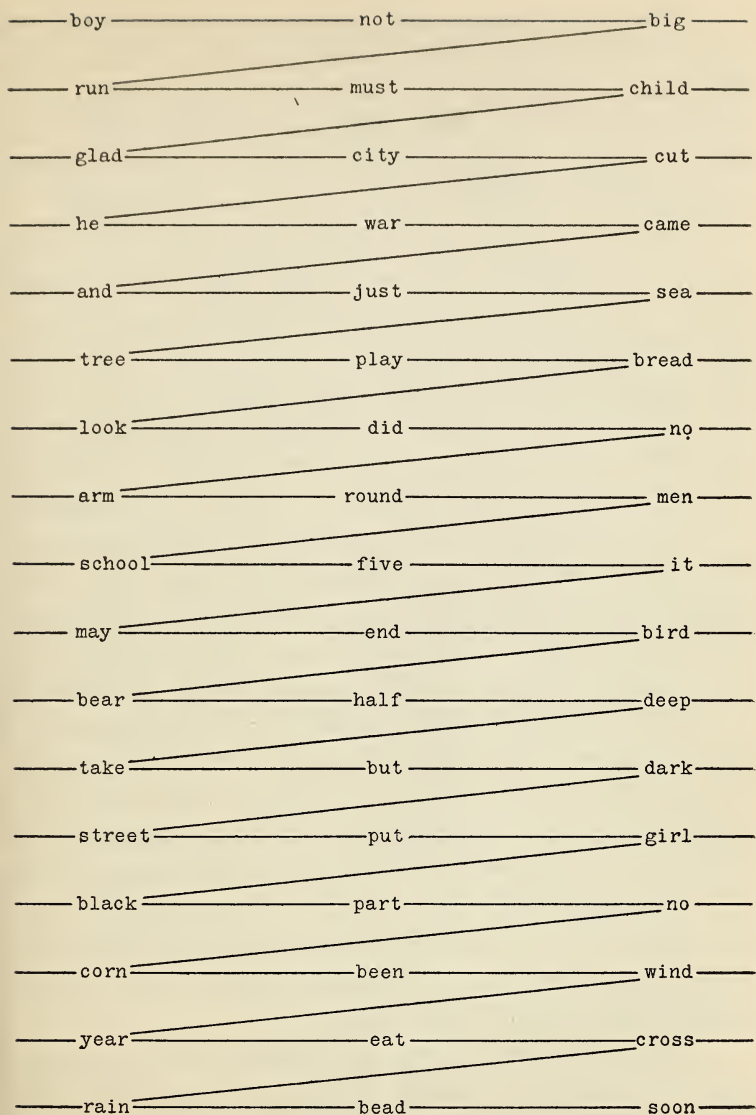


FIG. 6.—Eye-movement drill, No. 2 (words).

The third (3) type of exercise consists of pages on which each line has three groups of two words each, with spaces between the successive groups. The connecting lines from group to group on the same line are no longer necessary. The reading matter may be continuous, as shown in the exercise on page 103.

The directions are as before. The reader is to look once at each group of words, then look at the next group, and then at the third. The pupil who is watching should stop his partner as soon as he sees extra eye movements. The reader then begins the first line over again. His increased familiarity with the words will allow him to proceed further on each rereading before his partner halts him. As before, five minutes is a long enough period for one pupil to work, and two five-minute periods are sufficient for one day. The teacher needs from five to ten exercises of this character. The child is practicing not only correct eye movements, but he is beginning the work of learning to read by phrases, since he has to see two words at each fixation. It is worth while to devote two weeks, if necessary, to this type of exercise, using different sheets each day. Those children who are successful in reading the exercises in less time may be excused from the remaining drill. Two weeks is long enough, however. This type of exercise should then be abandoned, even though some of the pupils do not yet read an entire page without many errors.

The fourth (4) group of exercises in this series consists merely of simple stories so typed that the lines are about equal in length to those in a book, and the distance between the lines is a little more than average. The "stories" are hardly more than para-

The girl ran after her brother
 into the old house. Here they
 found their mother who was making
 a cake for them. They waited
 until the cake was all done
 and had had time to cool
 a little. Soon it was ready
 to eat. Their mother gave each
 a piece of cake and a
 big glass of milk. After they
 had eaten this cake they ran
 out into the garden. There they
 played for an hour under the
 apple trees. They started to build
 a little play house to show
 their friends. For over an hour
 they worked. Then it was so
 dark that they could not work
 any longer until the next day.
 They went back into the house.

1. What did the children eat?
2. What did the children start to build?
3. Why did they stop?

FIG. 7.—Eye-movement drill, No. 3 (phrases).

graphs. The first few should contain only the simplest possible words. Such an exercise appears below.

At our house we have five baby kittens. They are only three days old. One of them is all white. Two of them are white and black. One is all black. The other is black with a little bit of white under his chin; he also has white paws and a bit of white on each ear. All the kittens are still blind, so we do not know what color their eyes will be. Next week their eyes will open. Their mother has one blue eye and one yellow eye. Ever since the kittens were born their mother has been very busy. She has to feed them and keep them clean. Every day she washes each one from his head to the tip of his funny little tail. They are still so weak that they cannot stand up. Every time they try to get up they fall down again. All they do now is eat and sleep. But soon they will begin to play. Then we shall have lots of fun watching them play.

1. How many kittens were there?
2. How old were they?
3. What color were their eyes?
4. Could they stand up?
5. What did their mother do for them?

The directions are the same as before. A child is to look first at about the second word in the first line, then move his eyes to the middle of the line, then to about the second word from the end; that is, he is to make three fixations at approximately the same places on the line that he has been trained to look at—first with the dots, then with the isolated words, and finally

with the phrases. His partner again checks him. Whenever the reader makes an extra fixation he is to go back to the beginning of the story and start over. As his familiarity with the story increases, his eye movements will become approximately correct. At the end of his reading he should get at least four of the five questions right. If he does not, he should reread until he can.

A teacher needs about five exercises taken from each grade level up to her own. Thus, if she is working in the fifth grade, she will need twenty-five exercises of increasing difficulty. The pupils are to work through the entire series, checking each other. This assignment will require at least three weeks, and usually longer. The teacher should find time to observe each child's performance on one exercise a week; otherwise the pupils can train each other. The length of the daily practice period need not be increased; it is best to let the pupils work for only a short time at once, but work intensively.

The last type of exercise (5) of this series is included merely to assure transfer of training from the exercises to daily assignments. The pupils are ready for this final step when they have completed the story-reading described above. About twice a week each partner should watch the other for a few minutes while he reads from some book in current use. This amount of checking is generally sufficient to keep a child from going back to his earlier eye-movement habits.

The writer has used such a series of exercises dozens of times and can assure any teacher that the treatment prescribed brings results. The training period is two to three months long, but at the end of

that time the number of fixations has usually been reduced 50 per cent and the reading rate doubled, without the slightest bad effect upon comprehension—which, indeed, often improves. By the end of the training period the three-pauses-a-line habit has become just as unconscious as the earlier multiple-pauses-a-line habit. The teacher should be warned, however, against the almost fatal results of beginning the practice—as is sometimes done—with connected reading matter. A child who has been using ten fixations per line to get meaning will get none at all with only three. If meaningful material is used he will either become discouraged and decide that he cannot ever understand what he reads without more fixations, or else he will conclude that no one cares whether he understands or not! The exercise with the dots comes first because it has no meaning. The child is free to concentrate wholly upon eye movements. By the second week he can get a little meaning—which is all he needs to read three easy isolated words. After this introduction the eye movements have become partially automatic, and the pupil can attend somewhat more to the meaning of what he reads. At this stage he is given short phrases, which demand about the amount of comprehension he has to offer. It is not until he has had at least a month of training, from the completely meaningless to the partially meaningful, that he is confronted with ordinary reading matter. Even then he starts at a low level and works up gradually to his present grade placement. The first time he tries to read his daily assignments with three or four pauses per line he has had at least two months of training, each level of which has been carefully geared to the degree of comprehension he could be expected to show. He is therefore ready for this final step because his

new habits of eye movement have become automatic. Without the introductory training, however, any direct attempt to decrease the number of fixations is more likely to harm than to help. In planning any remedial work one should always remember that a pupil's daily assignments are the worst possible training materials, because they are both too hard and too important.

A REMEDIAL PROGRAM IN PHRASE-READING

The first part of this work may be done in either of two ways.* For a group of children it is most efficiently done by means of a dark lantern, in case the lantern can be kept all set up and focused. However, the amount of drill that can be given at one time without eyestrain is so short that the lantern becomes inefficient in case a teacher has to get it, set it up, and focus it each day. If a lantern is not easily available, flash cards can be used instead. Both methods will be described in the following paragraphs.

1. *Use of a Lantern:* If the teacher is going to use a lantern, she must first prepare her slides. The material needed for making them is inexpensive, and, of course, the slides can be used repeatedly with different classes and by different teachers. The main item in their preparation is time rather than money. The teacher should procure from a store that handles moving-picture supplies the materials for making the slides. These consist of some thin glass plates, some tape for binding them, and some "radio mats" upon

* If a metron-o-scope or ophthalm-o-graph is available it should be used in preference to the techniques here recommended. Absence of these special instruments need not, however, prevent a teacher from giving training in correct eye movements or phrase-reading. Because of their greater accuracy these aids are desirable, especially for the remedial reading class.

which the words to appear on the slides are typed. A radio mat is simply a small piece of transparent celluloid covered by a sheet of red carbon. The teacher puts the mat into the typewriter and types through the carbon whatever words she wishes to use. The carbon is removed and the celluloid piece put between two glass plates which are then bound together with tape. Preparation of these plates is a rather fussy job but not at all technical or difficult.

For the first series of exercises in phrase-reading a teacher needs to prepare about one hundred such plates. The first five should contain phrases eight spaces wide, such as "on a car." The length is then increased, one space for each five slides, until there are twelve spaces per slide; there should then be eight duplicates for each length through eighteen; at nineteen, twenty, and twenty-one there should be nine duplicates, each. The spaces between the words are always included in the total for the phrase.* Two samples of such plates appear below.†

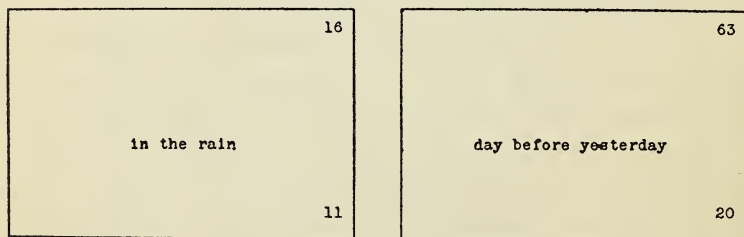


FIG. 8.—Slides for drill in phrase-reading.

* For junior high school classes the teacher can begin with phrases twelve spaces wide, using five slides of each length up to fifteen, eight of each length from there up to twenty, and ten of each length up to twenty-five. The same arrangement for high school should begin at fourteen, and for college at seventeen.

† The number in the lower right-hand corner tells how many spaces wide the phrase is; this figure should always appear. The other figure is merely a serial number.

When the entire number of plates is ready, they are used as follows: After the lantern has been focused and the room darkened, the teacher places a screen over the front end of the lantern. Most lanterns have a dust cover that fits the lens and is admirable for this work. If there is no such cap, a small piece of pasteboard will do about as well. Better than either is a shutter. Whatever device is used, the teacher first obscures the light from the lantern, places the first plate in readiness behind the screen, removes the screen, and *instantly* replaces it. If she moves as fast as she can, she will give an exposure about one-fifth of a second in length. The children usually see the shorter phrases without any difficulty, but soon they begin to see only part of each phrase. If they do not see a given phrase the first time, it should be given a second and third exposure, until everyone has seen it. Naturally this work involves a good deal of eye-strain and cannot be continued for more than ten minutes at the outside; five or six minutes is better. On the second day the teacher again begins with the easiest phrases, taking them in a different order, and continues until the children have had as much of the drill as seems advisable. Presently she can start with the slightly longer phrases, omitting the easiest ones. The work is continued in small amounts until the children are able to read phrases at least fifteen spaces wide in a single fixation. A few children will succeed in reading the longer phrases.

When this training in phrase-reading has been completed, one needs a second series of plates. The radio mats are large enough to contain about five lines of double-spaced typing. The teacher selects a brief paragraph from some simple story and types it, four

or five lines to each plate, using as many plates as are necessary to complete the paragraph. Two such plates appear below.

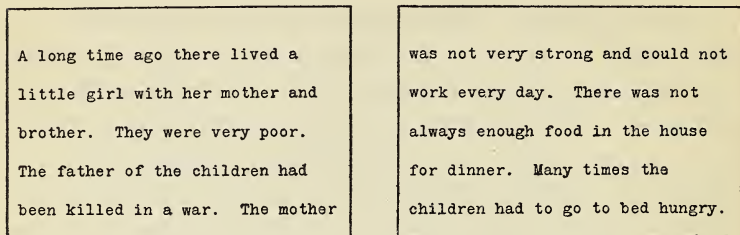


FIG. 9.—Slides for drill in phrasing connected reading matter.

When a teacher is ready to administer the drill, she covers the lantern with a screen and places the first plate in the lantern. She then exposes this plate twice as many times as there are lines on it. The pupils are directed to fixate their eyes near the beginning of the first line on the first exposure, near the end of the first line on the second exposure, near the beginning of the second line on the third, and so on—making two fixations for each line on the plate. If the plate has five lines on it and if ten exposures are given, a child gets only two chances per line. If he looks three or four times at the first line, he will never see the last ones at all. After the last exposure on the first plate, the teacher keeps the lantern covered while she changes plates and then proceeds at once to expose the second plate in the same way. This procedure is continued until the entire series of plates containing the paragraph has been exposed. The first time a paragraph is presented in this way only a few of the children can read more than one or two lines on any plate. Consequently, they will be unable to tell the teacher

what the paragraph was about. She should then start over again with the first plate and run through the series a second time in identically the same manner. On this repetition a few children will succeed in reading almost every line. Since some pupils are still uncertain what the paragraph is about, it should be exposed a third time. The object of this procedure is to force children to read connected material with a given number of fixations on each line. Since the radio mats permit a line of type about forty spaces in width, each pupil must see approximately twenty spaces at each fixation. He is thus forced to read by phrases.

The material presented by such a technique should, of course, be extremely simple so that there will be no difficult words to interfere with the rhythm of the eye movements. The teacher can prepare as many paragraphs as she finds desirable for this type of training. It has been the writer's experience that one or two such paragraphs a week give sufficient drill. Use of such an exercise every day is too fatiguing to the eye muscles. The lantern is superior to the flash cards for a group of children because all children can be trained at the same time. If the lantern is equipped with a shutter, the timing is far more accurate than it can otherwise be.

2. *Use of Flash Cards:* If a teacher is going to use flash cards, as will often be the case, it is wise to prepare about two hundred. The first ten should contain phrases eight spaces wide; one more space should be added for every ten cards. The ten cards of each type can be held together by an elastic band, and these small packages kept available to the pupils. The cards have one advantage over the lantern in that a pupil may give himself training. He selects a package of

cards containing phrases of a given length and a piece of cardboard somewhat larger than the cards themselves. Keeping the pack of cards covered by the cardboard, he places them face up on his desk. He then focuses his eyes upon the cardboard, removes and replaces it, exposing the card underneath for as short a time as possible. If he recognizes the phrase, he reaches underneath the cardboard with his free hand, removes the top card, and places it face down on some other part of his desk. If he does not recognize the phrase on this first exposure, he tries again. He continues these short exposures until he gets the whole phrase; then he removes the card as just described. He runs through the entire series of ten cards, exposing each one as many times as necessary until he has read them all. Then he places the pack of cards again face up underneath his piece of cardboard and goes through the series a second time. Since a pupil who needs a good deal of this drill will memorize the phrases on any given set of cards, the teacher has to prepare duplicate sets. The children can soon administer their own drill, if each set is labeled as to the length of the phrases, marked with a serial number, and bound together with an elastic band. The child then simply runs through the series by himself, taking each set in order until he has completed all of them. Twenty cards a day are about as many as can be used profitably; as the phrases get longer, ten are sufficient for a single drill.

It is possible, but difficult, to duplicate the paragraph reading with lantern slides. Unless one has easy access to a lantern it is best to omit this particular element in the training series.

3. *Phrase-Reading of Consecutive Material:* For

this exercise the teacher needs to prepare several typed or mimeographed sheets. She should have about five from each grade level, beginning with a grade four years below her own and ending with her own. Each page is composed of lines of the following type.

Long, long ago	an old king	had no son.
After a while	he might find	young boy who
could be king	he was dead.	began to search
for a boy	would make	good king.
He decided he	give every boy	his kingdom
a test that	show him how	courage and strength
each boy had.	sent a messenger	his kingdom
tell the people	he would choose	bravest boy
in the land	become a prince.	any boy who
wanted to try	have to kill	fierce dragon
who lived	deep, dark cave	many miles away
on a mountain.	big dragon was	so wild and strong.
Only three boys	whole kingdom	dared to go
even to the foot	high mountain	dragon lived.
One boy went	home again	he was scared
by the noise	dragon's roar.	second boy
tried to climb	dragon's cave	fell over
a high cliff	was killed.	third boy
long fight	finally killed	cruel dragon.
Then he became	adopted son	old king

1. Why did the king test the boys?
2. What was the test?
3. How many tried to pass the test?
4. What finally happened?

The pupils begin, of course, with the easiest reading matter. They should be instructed to look just once at each group of words, to supply the missing words

mentally if they need to, and to get what meaning they can, but never to look at any group of words more than once. The first reading of the first story is not likely to afford much meaning. It should, therefore, be reread by the same method a second, third, or fourth time, as may be needed. It is best to have the children work in pairs, checking each other's eye movements to make sure that there is only one fixation for each group of words. When a child thinks he can read these exercises at a given level correctly enough, he tells his teacher and she gives him a test. If he proves able to read with not more than five or six extra fixations per page, she promotes him to exercises of a similar type at the next level of difficulty.

The teacher does not need more than two or three copies of each exercise; in fact, she can get along with only one copy of each. Since the sheets are not marked, they can be used for several years. The material should not contain any difficult words and should be so grouped as to require three or four fixations per line.*

4. *Transferring the Skill Gained to Consecutive Reading Matter*: By the time a pupil has completed the foregoing exercises, he should be ready to read by phrases out of some simple story. His teacher should give him some selection that is easy and let him read it to himself while she watches in the mirror to make certain he is reading by phrases most of the time. If he is, it remains only to consolidate this habit by checking him from time to time as he reads his daily assignments.

* If desired, the material in these stories can be continuous, as in the short phrases shown in Figure 7.

CO-ORDINATION OF VARIOUS TYPES OF DRILL

A number of different exercises have been described in this chapter. Some of them are rather monotonous, and many of them make unusual demands upon eyesight. One five to ten minute drill in mechanics each day is sufficient, and it is advisable not to use drill of this sort every day. The work above described is sufficient for an entire semester of remedial work, in so far as the increase of speed is concerned. A teacher is advised to prepare not more than one set of materials of each type the first time she tries to use remedial exercises. It will be noticed that none of these exercises are marked in any way by the children. Consequently, the materials can be used repeatedly by successive classes. In other words, when a series of exercises is once made, it forms a permanent acquisition to one's equipment for teaching reading. During each semester a teacher can make one additional set of exercises, until she has available a complete outfit of drill materials for the remedying of common difficulties in the mechanical habits of reading.

It is best to proceed first with the suppression of vocalizing, then to the improvement of eye movements, and finally to phrase-reading. Each type of drill prepares the child for the next type. Although the progress is often slow at the start, it becomes more and more rapid per unit of work as the semester proceeds, because each skill gained acts as a basis for the next.

For the most part children enjoy these exercises, provided the work is not continued long enough to

induce fatigue. The exercises are different from ordinary reading materials. They are usually so arranged that a child can administer them to himself and can find out, either directly or from his partner, when he is successful. In each type of drill he has before him a definite objective: he knows what he is supposed to be doing, and he knows whether or not he has done it. A teacher often has to prevent children from spending too much time and energy on these remedial exercises; she rarely has to motivate her pupils to work harder at them. Since the materials are so interesting and useful and since they require little or no technical skill in their preparation, any teacher can gradually accumulate several series of exercises which will permit her to give appropriate drill in the various defects that lead to slowness in reading.

RESULTS OF ACTUAL EXPERIMENTS

There have been numerous attempts, more or less successful, to increase the speed of reading in one or more classes. Four sample experiments have been selected from various levels in school and are summarized briefly below.

(1) In a class of 27 college freshmen,² all of whom were poor readers, the rate of reading at the beginning of a semester of training was 213 words a minute—approximately sixth-grade level. For determining this rate, one form of the Stone Reading Test was used. These students all had intelligence scores higher than the lowest fourth of their class. Their slow reading could not, then, have been due to lack of ability. Analysis showed that most of them vocalized and all of them were word-for-word readers. Three hours a

week for a semester they practiced various exercises and drills for increasing speed. At the end of the semester a second form of the Stone Reading Test showed an average rate of 367 words per minute—a good speed for adults. There was no loss in comprehension; actually, more questions were correctly answered, although the relationship of correct responses to the amount read remained unchanged.

(2) An experiment,⁷ dealing exclusively with eye movements and vocalization, was carried on in a fourth-grade class of 20 pupils. The remedial work was done individually. Each day each child worked for fifteen minutes at exercises designed to decrease the number of eye movements and the amount of vocalization. As the work progressed, one pupil after another was dismissed from remedial drill because his eye movements had become normal and his vocalization had disappeared. As the class became smaller, the experimenter gave more time to each of the remaining pupils. The training continued for two months. The average number of fixations per line had decreased from 11 to 4, and the regressions per line from 2.5 to .5. The vocalization, which started as either loud or faint whispering, had completely disappeared for most of the children and had almost disappeared for the remaining few. The speed of reading (as measured by duplicate forms of the Monroe Revised Reading Test) had increased from 128 to 175 words per minute, while the comprehension rose from 9.2 to 11 questions correctly answered. During the same period a second fourth-grade room of 34 pupils in the same school made practically no improvement. This room, in which the children received the usual group instruction in reading, showed a rate of 130 words per

minute at both the beginning and the end of the two months; their average score in comprehension was also almost identical—changing only from 9.7 to 10 correct answers. The eye movements of this control class were not investigated.

(3) The third experiment⁴ includes results from the fourth through the eighth grades. Each class to be trained in more rapid reading was first tested in both speed and comprehension. In all, 816 children participated in the experiment. The time spent was 30 minutes a day for 36 school days. The average number of words read per minute by these classes at both the beginning and the end of the experiment is presented below.

TABLE II

SHOWING IMPROVEMENT IN RATE AS THE RESULT OF TRAINING *

GRADE	NUMBER OF PUPILS	WORDS READ PER MINUTE		
		Initial Test	End Test	Gain
4	236	155.7	236.4	80.7
5	154	190.7	277.8	87.1
6	128	197.8	292.6	94.8
7	206	205.6	321.6	116.0
8	92	220.8	393.0	172.2
	816			

* From J. A. O'Brien, *Silent Reading*. By permission of The Macmillan Company, publishers.

The speed showed an average increase of 110.1 words per minute. The degree of comprehension,* for all groups combined, rose 1.8 points; this gain is too small to indicate improvement, but it does show that there

* Not shown in this table.

was no loss in ability to understand, in spite of the enormous gains in speed. The ordinary class between the fourth and eighth grades increases its reading rate about 29 words per year. These children gained, in terms of normal progress, at least 3.7 years in 36 school days. The eighth grade gained the imposing total of approximately six years!

(4) In a certain junior high school 27 children were selected as being unusually poor readers.³ These pupils attended a remedial class twice a week for 50 minutes. A careful analysis of each child was made before the work began, and the drill given each was based upon the nature of the differences revealed. The pupils remained in the class at least eight weeks; some stayed as long as 24 weeks. The children were tested at the beginning and end of their training period and again 6 to 9 months later. This last testing indicated the amount of gain that could be considered permanent. Of the 27 children, 23 made gains equal to more than one year under normal methods of instruction. Nine pupils made over a year's progress in both speed and comprehension; 5 gained over a year in comprehension only, and another 9 in speed only. Eighteen of the 27 reduced markedly the number of fixations, 17 reduced the number of regressions, and 14 reduced the duration of their pauses. Thus, one pupil, who at the beginning had an average of 9.7 fixations and 1.7 regressions per line, with an average duration of 6.8 twenty-fifths of a second, showed at the end of his training period 5.7 fixations and 0.7 regressions per line with a duration of 5.4. In view of the total amount of time spent—between 13½ and 40 hours—these gains in fundamental habits of procedure are excellent.

SUMMARY

The speed of reading can be markedly increased without loss of comprehension if one is willing to take the reasonable precaution of beginning with material that is easy and interesting and of giving each child the type of drill he most needs. It is to be expected that a child will, at first, show a loss of comprehension during the time he is unlearning his bad habits and acquiring new ones. However, if any appropriate treatment is used, the teacher can be quite sure that the pupil's last stage will be considerably better than the first.

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PART III

GENERAL AND TECHNICAL
VOCABULARY

VIII

GENERAL READING VOCABULARY

FAILURE to understand what is read is often due simply to a lack of words at the child's command. He may be a slow reader for other reasons, but if his comprehension is low, he probably has an inadequate vocabulary. Many people feel that the real task of the elementary school is to furnish children with correct reading habits and an adequate fundamental vocabulary, and that only increasing maturity and experience are thereafter necessary for the development of comprehension. This view is perhaps not entirely justified, but it contains a good deal of truth. The contribution of the junior high school lies in the broadening of general vocabulary and the addition of many technical words. The senior high school adds more technical vocabularies and a greater depth of understanding. At any point, comprehension may be lowered if a child does not know enough word meanings. It is therefore necessary that teachers at all levels should learn to teach vocabulary and to analyze and remedy defects in this field.

Words are units of thought. Without them one can neither think nor read. Some teachers regard word drill as mechanical and meaningless; they prefer to concentrate on the general ideas presented in a story and let the meaning of the individual words emerge from the context. This system would be splendid if

it only worked! In the first place, word meanings can be inferred only if the vast majority of the words in a story are familiar. Second, even when a pupil has, through sheer inference, deduced a meaning, this process gives him no drill and he does not learn the inferred meaning well enough to identify the word when he again meets it; few words are acquired by a single repetition. In the third place, the general ideas in a story can only be understood if one already knows the words; consequently, the teacher who expects children to achieve the context first and the words later has put the cart in front of the horse. Let anyone who does not believe these assertions try to read a story in a foreign language, in which she has meanings for about half, or even two-thirds, of the words. An adult intelligence, can infer a small number of the missing meanings, but, even so, the reader cannot find the "general ideas"—in fact, there is no story. If another person who knows the tale tells the substance to the reader, then the latter can infer many more meanings; but, by his own unaided efforts, he must get almost every word before there is a context. Words are not, then, isolated and meaningless units. They are, instead, the *sine qua non* of reading and thought.

There is no easy road to the acquisition of vocabulary. Anyone who has ever studied a foreign language should know that few words are casually "picked up": most of them are deliberately learned. Usually the learner is not successful if he tries to remember words in their context without isolating them. He may grasp the meaning of the particular sentences in which one or two new words are used, but he generally fails to recognize these unfamiliar words when he meets them again; that is, they are not permanent acqui-

tions. The only sure way of learning a word is to isolate it, analyze it, study it, use it, and occasionally review it. Such drill can sometimes be made interesting, sometimes not. If it can be, so much the better—but the sugar-coating is not essential.

The first-grade teacher, fortunately, has no delusions in this matter. She knows that her job is to teach a small number of words very thoroughly. Naturally, she presents new words in as interesting a way as possible, but she does not shrink from drill, even when she cannot make it exciting. If she is at all observant, she knows that word drill is monotonous chiefly to the teacher, not the pupils. In fact, monotony is an experience that has two entirely different emotional accompaniments for adults and children. The intelligent adult usually dislikes it. The dull adult and the normal child generally love it; to them it represents merely something secure, familiar, and thoroughly known. No adult needs to avoid giving drill merely because it appears to her monotonous.

Second- and third-grade teachers also give a good deal of attention to word drill, and the vocabularies of their charges grow apace. Unfortunately, teachers in the upper grades—especially in the years after elementary school—are definitely afraid of drill. In proportion as word study is abandoned, the added increment of vocabulary each year becomes less. If a teacher wants her pupils to have large reading vocabularies she will have to use some direct form of word study. She should not expect to find a painless method by which pupils can absorb meanings, without study and without effort.

If the comprehension of pupils is low, there is no quicker way to improve it than to broaden their

vocabularies. Their comprehension will then improve automatically. The three chapters in this section have been so designed as to emphasize the absolute necessity of word-meanings for adequate comprehension and to assist the teacher in developing the needed vocabularies.

Two kinds of vocabulary have been recognized—general and technical. The words considered “general” are those common to all types of writing; in fact, they are the words without which nothing can be written. The following list contains samples of general vocabulary: *the, that, each, at, in, from, one, until, not, know, only, of, with, them, learn, easy, bring, must, few, have, set, want, should, although, any*. A vocabulary of about five hundred such words is essential as the fundamental basis for reading. The work of the first year and a half of elementary school is concerned with the acquisition of these absolutely essential general words. In about the third grade the child meets his first technical vocabulary. Here he begins to read problems in arithmetic which employ such special words as *inch, yard, measure, loss, gain, price, subtract, zero, times*. By the end of elementary school a child should have acquired small special vocabularies in arithmetic, English composition, geography, history, nature study, and hygiene. The actual number of such terms is not large, but these words are vital, not only because they enable a pupil to read his daily assignments but because they form the necessary introduction to the technical vocabularies which will be presented to him in junior and senior high school. It is only by concerted and intelligent effort on the part of everyone concerned that enough words are learned to permit the reading of daily assignments.

DETERMINATION OF ESSENTIALS

The most extensive and familiar investigation of general vocabulary is the *Teachers' Word Book* by Thorndike.²¹ This book contains simply a list of the 20,000 most commonly used words in the English language. In the course of the research necessary for establishing this list one especially significant fact emerged. There were about 500 words of extremely high frequency; next came approximately 1500 words of medium frequency; the remaining 18,000 in the list have an extremely low total number of occurrences. The real nucleus of a reading vocabulary is, then, not over 2,000 words. When one gets beyond this core, the frequency of any given term depends upon what type of reading matter is being analyzed. For example, the word "molecule" is in the twelfth thousand of the Thorndike list. However, in textbooks in almost any college science its occurrence would be relatively higher; in books dealing with present-day political situations its frequency would be almost nil; in poetry it would not be present. A person learns or does not learn the words in the upper thousands in Thorndike's list, according to what sort of reading he does in high school and later. These words are therefore gained as one travels along; few people learn them all. The words from the third through the twentieth thousand do not constitute more than a small per cent of the total number of words read during a lifetime. In ordinary reading matter, 9 words alone make up 25 per cent of all the words used; 69 terms constitute exactly 50 per cent, while the 732 commonest words occur often enough to equal 75 per cent of the total.^{2, 7}

To illustrate both the relation of frequency to

difficulty and the increase in difficulty from one thousand to the next, the following words have been selected, five from each thousand of the Thorndike list. In the first five groups the words from the lower and upper half of the thousand are shown separately.²¹

1st thousand (lower half): at, am, air, and, all

1st thousand (upper half): already, afraid, act, ago, after

2d thousand (lower half): acre, agree, alive, anger, accept

2d thousand (upper half): admit, alike, approve, arrow, attention

3d thousand (lower half): accident, annual, absent, arise, aloud

3d thousand (upper half): ache, adventure, altogether, amaze, assemble

4th thousand (lower half): amuse, agony, audience, ankle, adorn

4th thousand (upper half): agent, awaken, assert, ambitious, accent

5th thousand (lower half): admiral, afflict, almighty, airy, amend

5th thousand (upper half): avail, attribute, aspect, arctic, atmosphere

6th thousand: abate, assistant, amiable, antique, absorb

7th thousand: adjacent, authentic, assent, alcohol, assailant

8th thousand: accumulate, allot, astronomer, aristocrat, ascent

9th thousand: auction, advent, annihilate, antidote, alabaster

10th thousand: adamant, athwart, alkali, anesthetic, accost

- 11th thousand: audacious, asset, atone, alcove, arsenic
 12th thousand: accrue, adrift, armament, aspirant, allegory
 13th thousand: accentuate, ambiguity, apoplexy, amphibian, acme
 14th thousand: audit, admixture, anonymous, acacia, aptitude
 15th thousand: absentee, agility, amenable, antedate, analytic
 16th thousand: axiom, affluence, astringent, alibi, ashen
 17th thousand: awl, asthma, arraignment, atheism, altruistic
 18th thousand: affiliation, agrarian, akimbo, amorphous, alignment
 19th thousand: acropolis, autonomy, ambergris, arnica, alpaca
 20th thousand: ambient, agaric, asceticism, aigrette, almoner

Perusal of this list should quickly convince one that words beyond the first five thousand are definitely hard for elementary school children and that those beyond the tenth thousand are, for the most part, either literary or technical.

1. *Mastery of General Vocabulary*: Pupils in elementary school are quite capable of mastering the really essential number of words. The average vocabulary, as acquired by ordinary classroom instruction, for the various grades is given below.¹⁸

NUMBER OF WORDS		NUMBER OF WORDS	
GRADE	RECOGNIZED	GRADE	RECOGNIZED
Low 1	280	Low 6	5000
High 1	620	High 6	5400
Low 2	820	Low 7	5800
High 2	1220	High 7	6100

		NUMBER OF WORDS			NUMBER OF WORDS
GRADE		RECOGNIZED	GRADE		RECOGNIZED
Low 3	.....	1900	Low 8	.....	6600
High 3	.....	2500	High 8	.....	7100
Low 4	.....	3100	Low 9	.....	7500
High 4	.....	3600	High 9	.....	7800
Low 5	.....	4000			
High 5	.....	4500			

These standards of vocabulary are based on ordinary teaching, without diagnosis or remedial work. If work were arranged so that each child could concentrate upon the words he did not know, the achievement would be far beyond that shown above.

VOCABULARY TESTS

Various tests in general vocabulary are commercially available. The teacher can make for herself tests that are about as good, provided she follows the same selection and form as those used by test constructors. The ordinary test of vocabulary is based upon the *Teachers' Word Book*. In order to make such a test, one selects at random ten words from each thousand of the twenty in the list. So long as the words are taken at random it does not make any difference which ten are selected; it is desirable for practical reasons to choose words that can be easily and clearly defined. One then constructs a test which requires the recognition of the meaning of each of the selected words. Either of two test forms is possible; the first is a matching technique, as illustrated below.

DIRECTIONS: Find the meaning of each word in the column at the left. Then write the letter in front of the meaning in the space in front of the word.

- | | |
|------------------|------------------------------|
| () 1. fury | a. to save someone |
| | b. to run fast |
| () 2. roam | c. extreme anger |
| | d. deep unhappiness |
| () 3. rescue | e. a great deal of something |
| | f. to walk slowly about |
| () 4. abundance | g. many people |
| | h. a flag |
| () 5. banner | i. an enemy |
| | j. to arrive first |

If a teacher uses this method of presenting the words, the ten from each thousand should be arranged in two such groups as that shown above. If more than five items appear in a group, a pupil is likely to miss definitions merely because he cannot locate them. It should be noted that there are twice as many definitions as there are words. For testing purposes, this arrangement is always desirable. If the number of words equal the number of definitions, the person being tested always makes errors two at a time.

If a teacher does not like the matching technique she can use a multiple-choice form. In this case, she constructs items such as those shown below.

DIRECTIONS: Read each question below and draw a line under the right answer:

1. What does fury mean? sadness dislike
 anger fear beauty
2. What does roam mean? to win to think
 to stumble to wander to earn money
3. What does rescue mean? to drown to see
 a vision to fall down to answer to
 save someone
4. How much is there to eat where there is an
 abundance of food? only a little a great

deal enough of some foods but not enough
of others no food at all only the rich
have food

5. What is a banner? a round piece of metal
a prize a puzzle a flag a period of
time

If she uses this method, it is best to leave a space between the last word from one thousand and the first word from the next, so that the different thousands are marked off from one another.

Naturally a test of 200 words,* regardless of the form preferred, is too long to be given at any one time. Actually, however, a test that samples the entire 20,000 words need never be given. The simplest way is to mimeograph the easiest 50 items, give them as a unit, and score the number right from each successive thousand. In any group of children old enough to take a vocabulary test at all, a teacher will find that the selections from the first 5,000 are not sufficient to measure the total vocabulary of many children. The pupils will get some words right out of even the hardest group in this first test. The teacher therefore gives another test of 50 items, presenting samples from the second 5,000 on the list. If the children tested are in the elementary grades, they will reach the top of their vocabulary by the end of this second test. The two remaining forms may therefore be omitted. In grades beyond elementary school the teacher proceeds to measure in similar fashion the third 5,000 from the Thorndike list. In some high school classes she may need to measure the last 5,000. For both high school and college, however, the test covering the first 5,000 may be omitted and these words assumed as known, unless one is dealing with pupils in a special class.

* Ten words from each of the twenty thousand.

When the teacher has given as many of these tests as are necessary to reach the end of the pupil's vocabulary, she simply counts up the total number of items correct in all the forms and adds two zeros to this total. For example, if a child makes a total score of 31, his estimated total vocabulary is 3,100. It will be remembered that each ten words in these tests are random samples of a thousand words. Consequently, the pupil's score bears the ratio to his total reading vocabulary of ten to a thousand; this relationship is most easily expressed by adding two zeros to each pupil's score. This number is, of course, only an approximation, but it is good enough for practical purposes.

The trouble with all such tests is that they give a teacher only general information. She can find out that John has a large vocabulary for his grade and Mary has a small one, but she will not discover *which* unusual words John knows that make his vocabulary so large or *which* common words Mary does not know that make her vocabulary so small. It is precisely this information that she wants most to obtain for teaching purposes. The test tells a teacher upon which children she needs to concentrate, and it tells her whether or not the members of her class as a whole know as many words as can be expected of them for their grade. Although the children who need remedial work can be found by means of such tests, the test results cannot be used as the basis for the needed training.

ESTIMATING VOCABULARY DIFFICULTY

It is important that a teacher should know how difficult the vocabulary is in any book that she intends

to use regularly. Because a book is labeled as a fourth-grade reader does not prove that it is appropriate for fourth-grade consumption. The simplest way of estimating the vocabulary load of a book is to make what is called a "thousand word count."¹⁵ To do this, one examines the first line on every other page of a book and lists the *different* words occurring on these lines. For instance, on the first line of the first page there may be the words "Once upon a time there was a king who"; upon the first line of the third page, the words "many times during each year when the king saw"; and on the first line of the fifth page, the words "each time the king saw him, he was very." The sum total of words is 27. The 18 *different* words are listed below.

a	he	many	the	upon	when
during	him	once	there	very	who
each	king	saw	time	was	year

Until she has reached a total of a thousand the teacher should list the separate words and keep count of how many words have been examined. In that number she will not find more than 500 that are different, and usually not over 350. There is no need to count the frequencies; the duplicates are included in the total, but each different word is listed only once. If the book is so short that the first line on every other page does not yield a total of a thousand words, the teacher should go back to the beginning and take the first line on the pages she omitted on her first count. If she still does not have the necessary total, she should take the bottom line on every other page. On the other hand, if a teacher has been examining the first line on every other page and finds her total of words more than 500 by the time she reaches the middle of the

book, she should take the first line on every third page throughout the remaining half in order to obtain samples from pages all the way through the book. The selection is made in this way to get a random and systematic sample from the entire book. It is not desirable to take the thousand words out of the first few pages, because these may be more or less difficult than the remaining portions.

When a teacher has looked at a thousand words, taken at random, and has listed the different ones, she is ready to estimate the reading difficulty of the book as a whole. The first method of measuring is to compare the number of different words with the averages for each grade. These averages are given below:

	No. OF DIFFERENT WORDS		No. OF DIFFERENT WORDS
Primer	208	Fifth—sixth	425
First grade	246	Seventh—eighth	455
Second grade	294	Ninth—twelfth	470
Third grade	340	College	502
Fourth grade	397		

Thus if a book intended for the fourth grade contains 201 different words in a sample thousand, it is too easy. If it contains 462 different words in a sample thousand, it is too hard. The oftener the same words recur in reading matter, the more drill each word receives and the more quickly the reader masters the necessary vocabulary. Consequently the fewer different terms there are, the easier is the reading matter. Even in the most difficult books there are rarely more than 500 different words per thousand because of the numerous repetitions of such words as “the,” “and,” “if,” “to,” and so on.

The second measure is the determination of the

TABLE III
SHOWING TABULATION OF THORNDIKE FREQUENCIES
FOR EIGHT BOOKS *.16

THORNDIKE FREQUENCIES BY THOUSANDS	BOOK ANALYZED							
	Primer	Second Grade Reader	Fourth Grade Reader	<i>Kidnapped</i>	Junior High School Science	High School History	College Text in Psychology	Medical- School Physiology
Not in List	2	3	11	12	2	7	10	35
19,001-20,000. . . . .	..	..	1	0	0	0	3	3
18,001-19,000. . . . .	..	..	1	0	3	2	4	1
17,001-18,000. . . . .	..	1	0	1	1	0	5	2
16,001-17,000.	1	..	1	1	0	3	3	3
15,001-16,000. . . . .	..	..	2	0	0	2	6	5
14,001-15,000.	2	..	1	1	4	1	8	1
13,001-14,000. . . . .	..	1	2	2	1	6	14	6
12,001-13,000. . . . .	..	3	2	1	4	3	6	6
11,001-12,000.	1	..	1	1	2	3	7	3
10,001-11,000.	1	..	2	4	2	3	8	6
9,001-10,000. . . . .	..	1	2	2	2	5	10	11
8,001-9,000	3	..	6	2	3	8	15	11
7,001-8,000	1	..	1	3	15	10	17	24
6,001-7,000	1	4	2	4	13	15	26	21
5,001-6,000	4	10	8	9	17	13	8	5
4,001-5,000	1	7	3	8	19	28	22	17
3,001-4,000	9	8	20	16	24	33	24	18
2,001-3,000	8	20	27	19	42	48	31	37
1,001-2,000	6	52	71	50	61	81	54	33
501-1,000	16	63	71	55	68	64	38	47
1-500	148	195	213	208	196	184	144	119
Total	204	368	448	399	479	519	463	414
Median	345	470	576	480	820	1,141	1,921	2,351
% in lowest 1,000	81	70	63	66	55	47	39	40
% above 10,000	3	2	5	6	4	5	16	17
% above 20,000	1	1	2	3	.5	1	2	8

* These figures are based on thousand-word counts found in the master's thesis of Bertha Lively, Ohio State University, plus two more added by the writer.

“commonness” in general usage of the different words already listed. One must first look up each of these words in the *Teachers’ Word Book* and note down in which thousand or half thousand the word occurs. These Thorndike frequencies are then tabulated as on the opposite page. This sample tabulation contains results for a primer, a second-grade reader, a fourth-grade reader, *Kidnapped*, a junior high school science book, a senior high school history, a college text in psychology, and a medical-school physiology. There are several points of interest about this table. First to be considered is the number of different words. As compared to the norms, the texts for college and medical school are quite easy, while the two readers and the high school history are far too hard. In addition to the range of vocabulary it is desirable to have a measure of the average difficulty. The Thorndike frequency of the median word in each column gives an indication of the difficulty. The position of the median word in the entire frequency range covered by the *Teachers’ Word Book* varies from 345 for the primer to 2,351 for the text in physiology. These numbers mean that the median word for the primer was the 345th in frequency from the most common word in general reading matter, while the median word of the other book was the 2,351st from the bottom. These figures should be compared with the standards for the grades, as listed below.

FREQUENCY OF MEDIAN WORD		FREQUENCY OF MEDIAN WORD	
Primer	352	Fifth—sixth	678
First grade	399	Seventh—eighth	825
Second grade	437	Ninth—tenth	1265
Third grade	488	Eleventh—twelfth	1500
Fourth grade	553	College	1950

It can be seen at once that the second-grade reader, the fourth-grade reader, and both college texts are more difficult than the average for their respective levels.

Finally, one should consider the number of extremely hard and infrequent words per thousand. Although the number is small, these words are certain to present the pupil with serious difficulty because they are completely beyond the range of his speaking vocabulary. In the table above, per cents are given of the words in a random sample of a thousand having frequencies beyond both the first 10,000 and the first 20,000 in Thorndike's list. Thus, for the junior high school science 4 per cent of the different words were outside the most common 10,000 and .5 per cent outside of the most common 20,000; for the college textbook 16 per cent were above the most common 10,000 and 2 per cent do not appear at all in Thorndike's list of the 20,000. The norms for the various grades appear below.

	PER CENT OF WORDS ABOVE THE FIRST 10,000	PER CENT OF WORDS OUTSIDE THE MOST COMMON 20,000		PER CENT OF WORDS ABOVE THE FIRST 10,000	PER CENT OF WORDS OUTSIDE THE MOST COMMON 20,000
Primer	0	0	Grades 5—6	3.5	1
Grade 1	0	0	Grades 7—8	5	2
Grade 2 .....	.5	0	Grades 9—10 ...	7	3
Grade 3	1	0	Grades 11—12 ..	10	4
Grade 4	2	1	College	14	6

In terms of these norms almost all the books contain too many hard words, especially those intended for use in elementary school. It should be said, however, that all these books are at least ten years old and some of them are older. Most modern books would undoubt-

edly compare more favorably with the norms because recent materials have been checked against the Thorndike list before they were ever published.

There are, then, three measures of difficulty to be determined from the thousand-word count—the total number of different words, the Thorndike frequency of the median word, and the per cent of unusually difficult words. Some books meet one standard but not the others. Thus, the high school history uses far too many words but appears to be below average in difficulty. The primer has about the average number of different words, which are of less than average difficulty, but it uses enough infrequent words for a sixth-grade book.

The results from Stevenson's *Kidnapped* have been included to show that the problem of vocabulary can be solved. This book contains an interesting and well-told story. The number of different words per thousand is approximately fourth-grade level and the frequency of the median word is below average for the third grade. The 12 words that are not in the Thorndike *Word Book* were either the names of characters or Scotch forms of common words. This story is easier than the fourth-grade reader. Those who have given thought to the matter find that the wide dispersion of vocabulary, so often characteristic of readers and textbooks, is not in the least necessary. The writers have used a variety of words merely because they did not realize how many they were using—not because they actually needed such a large number to express their meaning. Without any loss of meaning, and with little if any sacrifice of style, a writer can reduce the range of his vocabulary and lower the difficulty of his material by the judicious use of synonyms and by a careful study of the words he uses.

Naturally, a teacher cannot take time to make a thousand-word count for every book she uses, for it takes the average person about four hours to analyze a single text in this way. The analysis is especially recommended whenever the teacher thinks a given book inappropriate for her pupils or when she is considering new books about which she has no accurate information.

METHODS OF TEACHING VOCABULARY

There are relatively few methods of developing vocabulary that are usable with an entire class. For the most part the work in this field is specific and individual. Class time can therefore be used to more purpose if it is spent in the study of different words by each pupil than by drill on the same words for all children.

1. *Group Work*: There is, in general, only one point in the procedure at which class instruction is really valuable and efficient. Before the pupils read a story or an assignment, the teacher should look through it and select from six to ten words that might give difficulty. She should present these words to the class and let the pupils study them. Even here, there is some wasted time because a few of the pupils already know the meanings and because there is no way of making certain that those who do not, actually learn them. However, the amount of time spent is usually not large and enough learning takes place to pay for the investment of time and effort. At the end of a story, no two pupils will need drill on the same words; the situation then calls for individual remedial work—not class instruction.

In the first and second grades of school the teacher can build vocabulary by the use of phonetic drill on word-families. Not every pupil in the room will learn every word, and many pupils will for some time recognize the words only when presented in families and not when a single word from a family is met in context. In the course of time, however, the children do acquire a greater vocabulary by means of such drill than they are likely to get without it. Class, rather than individual, drill is better when this work is first introduced because the children can help one another with the pronunciation.

In the third and fourth grades, drills in dividing words into syllables and in pronouncing the successive syllables are useful. In the fifth and sixth grades, a study of prefixes and suffixes will contribute to the building of vocabulary, since each prefix and suffix has its own meaning. In the sixth, seventh, and eighth grades, brief exercises in the use of dictionary are helpful. The chief objection at the present time to such exercises is the fact that in many schools there is no dictionary appropriate for children. Where such a dictionary is available, these exercises—especially if arranged in the form of games—are beneficial in enlarging vocabulary, in training pupils in the actual use of the dictionary, and in building up a habit of using it for reference. These various types of drill will be described more fully in the next chapter, since they are equally valuable in remedial work.

The basic words to be taught are selected automatically for the teacher by the adoption of those books to be used by all pupils in a given grade or class. Any modern series of basic readers has already been checked against the *Teachers' Word Book*. The text in

any class immediately determines the extent and content of the necessary vocabulary. Thus the teacher's main problem is not the selection of words. Instead, her chief tasks are, first, to distinguish the essential from the nonessential terms and, second, to make sure that each child learns every essential word. To attain these ends classroom instruction is only partially adequate. The teacher must rely in large measure upon individual training.

2. *Individualized Work*: It is not humanly possible for a teacher to be responsible for knowing at all times just which words each child in her class does not know. Yet the efficiency of her teaching depends essentially upon determining exactly this fact. To be sure, the size of the vocabulary for a class as a whole will increase at a moderate rate if the teacher simply presents two or three new words each day and trusts to luck that most of them will be remembered. A far larger vocabulary will, however, be acquired in less time if each child in the room concentrates exclusively on words he does not know. Mastery of vocabulary is a highly specific and individual matter. If one were to test a room of forty children, to determine each child's knowledge of a given 200 words, he would find that no two children had exactly identical vocabularies; it is entirely possible for each of two children in the room to know 79 terms out of the 200 and still not have one word in common. Word knowledge is so individual that no teacher can possibly keep in mind—or for that matter even discover—the exact degree of mastery achieved by each child for any selected number of words.

There is only one really efficient way of individualizing training in word study, and that is to have each

pupil keep track of the words he does not know. The procedures involved are simple. The teacher first supplies each child with twenty-five or thirty slips of paper. If she can obtain 5" by 3" library cards and cut them in half, these small cards are better than paper slips because they can be handled more easily. She then instructs the pupils to copy each unknown word out of the books they read, writing one word on each card. The cards should be in readiness whenever the pupil is reading anything, no matter what the subject matter of the book may be. Since almost all the words thus recorded will be within a child's understanding as soon as they are pronounced, the teacher should let the pupils get together from time to time in groups of threes, in which each one shows the others the words he does not know. Most of the words that have been collected by all three will be recognized by one child or another. Any remaining words may be looked up in the dictionary if the children are old enough or handed to the teacher for her to explain. After the words are identified, each pupil goes through his own cards, saying each word he can remember over to himself. The cards containing those words he can now identify he puts in one pile; the words he cannot remember he puts in another. The three children in each group now pick up the cards containing words whose meaning they have forgotten and again identify these words for each other. Then each pupil reads through his own cards, once more arranging the words into two piles—those he now knows and those he has not yet learned. This procedure should continue until the pile of unknown words has disappeared.

The frequency of periods devoted to this individualized vocabulary drill should depend upon how

rapidly the cards accumulate. Most children cannot handle more than twenty-five cards at once in this way. When the pupils have between twenty and thirty, the teacher should use the reading period for this drill. The cards used at one period are to be kept for a while and reviewed two or three times during the next month. When a pupil can go through a collection of cards easily, fluently, and accurately, he throws them away. Usually, one period a week of word study, carried on in this highly individualistic manner, will develop an adequate reading vocabulary for any intelligent child. In the first place, he knows which words to study. In the second place, he gets a chance to concentrate on those words and no others. In the third place, he is taught the meaning by his own classmates, who are always more effective motivators than an older person. And finally, he can see his own progress. If, for instance, he starts a week with seventeen unknown words and if at the end of that time has learned fifteen of them, he knows he is progressing. Every week each child has as his objective the learning of the words he has collected, and at the end of each week he knows just how close to that objective he has come. As a matter of fact, most children will get out their packages of cards and run through them whenever they have a few minutes of leisure. This procedure seems to give them a sense of mastery and, as a consequence, a feeling of great personal satisfaction. Learning words ceases to be monotonous and becomes interesting. Of course, not every child learns every word he has thus selected, but even if he learns half of them his vocabulary will grow considerably faster than by any method of group construction.

It will be noticed that the responsibility both for

selecting the words and for learning them is put upon the child rather than the teacher. Her job is to remind him of this responsibility from time to time, by providing him with cards, encouraging him to use them, and setting aside periods for study. She can also help him with definitions when no one in his group recognizes a given word. The responsibility, however, rests essentially on the pupil. This is exactly where it must rest, if vocabulary is to be acquired. No one else can tell a child which words in a story he does not know, but he can list them for himself. No one else can take the responsibility for finding out the meanings, because each child in a room of forty has a different list, and no teacher can teach forty lists simultaneously. Finally, no one can learn the words except the pupil himself. The whole business is thoroughly individualistic.

As pupils get into junior and senior high school they are exposed to a larger number of new words, aside from the technical terms in various subjects. They have to develop a reasonable degree of judgment in deciding which of these words to learn. Even though they are by this time more mature and can consequently learn more words than in the early grades, they will still encounter too many for a thorough mastery. They should be told frankly that not all the new words need to be learned and that they should write down on their cards chiefly words that recur frequently. In other words, they must learn to distinguish between the essential and nonessential.

This individualized work may seem unnecessary and cumbersome; actually it is neither. The teacher's real job in the matter is to "sell" to each pupil in her room the conviction that his vocabulary is his own

business and that he alone is responsible for its development. As soon as he takes an active interest in the matter, the number of words he can recognize increases enormously. The use of the cards permits him to keep the known separated from the unknown. Moreover, most children like to play "solitaire" with their cards; they also like to recite to each other. They soon reduce the whole affair to a game. Usually games are decidedly inefficient for learning purposes, but this one seems to work.

A few examples of the same technique carried out in individual cases may prove of interest.

In September, 1925, James was thirteen years old* and in the sixth grade. His home conditions were excellent. At the age of six James had spent a month in the first grade. Early in the semester, he had an attack of influenza which kept him in a delicate state of health, so he was withdrawn from school for the year. In the meantime his father died, and the following year the family moved to the Far West where James attended school for a year. The next year the boy was sent to a private school for a while and then transferred to a parochial school. Here he was at first in the second grade but was soon promoted to the third on account of his age, size, and general ability—although he was at the time deficient in reading. The following year he entered the fourth grade, where he began to feel his reading handicap because he was not able to prepare lessons in the content subjects. His mother helped him somewhat by reading aloud, so that he was always prepared reasonably well. He was unable to take a written test, however, because he could not read the questions nor spell well enough to answer them when they were read out loud to him.

* Used by permission of the *Catholic Educational Review*.

When James was in the second half of the fifth grade he could not read primer material. The next year he was kept in the same grade for a month and then promoted because he was above standard in all subjects except reading and spelling. At this time systematic remedial work was started. A preliminary study by means of both formal and informal tests showed that James did not know enough words. He was also very sensitive about his deficiency. Once he had told his mother that he was praying to God, not for skill in reading, but to know why he could not gain that skill and be like everyone else. James obviously wanted to read badly enough but when the remedial work was actually begun he showed a real dread of his daily twenty minutes' period of individual instruction. His teacher tried to interest him in books, but failed. Even ten minutes of work seemed to be more than he could stand at once. Gradually, however, he lost his fear and began to gain a little confidence. The first steps in this child's progress were extremely slow, owing to his nearly complete emotional blocking. The training he received consisted almost exclusively of word drill, with some work in phonics. By the end of six months James was reading easily in fifth-grade books. At this time his test scores on a silent reading test showed a score in speed average for the sixth grade and a comprehension score between the sixth and seventh grades. A year later James was able to prepare his lessons unaided.¹⁷

Melvin * was sent to a remedial teacher for individual work because he could not read the material in the low second-grade books. No formal test was given, but it was at once evident that he had an inadequate vocabulary. Each day he came for fifteen minutes' instruction. The work began with the oral reading of a

* Used by permission of the *Catholic Educational Review*.

primer. Each day the teacher wrote down on separate cards the words Melvin did not know. When eight or ten such cards had accumulated, the reading was stopped, and Melvin was taught the words he had missed. Then the material was reread. Melvin took the cards back to his room with him and studied them at intervals during the day. On the next day these words were reviewed. Any that he did not at once recognize were returned to him. The others were filed. After about three weeks the instructor used the first five minutes of the period for phonetic work with word-families. Presently she gave Melvin two or three blank cards every day and asked him to find unknown words in his regular reading in class. Most days he brought back words he had copied from his class books. These were added to the collection. At the end of six weeks, the oral reading was discontinued and the whole time was spent on word study. The teacher got a copy of the reader Melvin was using in class and prepared a list of terms that he was likely not to know. During the training time Melvin first pronounced and then learned these words. He soon became very proud of his rapidly growing file and would go voluntarily before school and run through part or all of his collection. Daily he brought more and more words for identification. Gradually practice exercises were introduced, any new words being treated as before. At the end of the semester Melvin had learned no less than 462 words. When this number is added to the 150 or so that he knew at the beginning, his total vocabulary had increased to at least 600 words—which is about normal for high first-grade children. Actually he must have known more because he scored in the first ten in the class on the Gates tests used by his room teacher at the end of the semester. No other remedial treatment beyond that described was given.

SUMMARY

Only the teacher in the first grade has succeeded in solving her problem of vocabulary with any degree of completeness; she has a small, compact, and relatively unvarying vocabulary to teach. Even in the second grade the task becomes more complicated, and by the middle of the third year there are far too many words for the children to learn. The essential things in solving the situation are (a) to stick to the small "core" vocabulary so far as the entire class is concerned, and (b) to make some arrangement by which each teacher can be responsible for covering a given number of words. At all levels above the first grade, too many words are used in the books the children read. On the one hand there should be a reduction in the vocabulary demands of the books used by everyone, and on the other an arrangement for the development of a wider vocabulary among those pupils who are above the average in ability. The present situation is relatively ineffective because there are too many words for the average or dull child, and not enough for the bright pupil. The vocabulary problem can be solved, even though it has not been, as yet.

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IX

SPECIAL VOCABULARIES

THE problem of technical vocabulary begins in the second or third grade, with the introduction of special terms in arithmetic. In every successive grade the load gets heavier, increasing markedly at the beginning of junior high school, of senior high school, and of college. The elementary school teacher is concerned only with the vocabulary in arithmetic, geography, and the start in English and hygiene. From junior high school on, each teacher is responsible for teaching the words that are necessary for an understanding of the books to be read. The main problems of technical vocabulary are those already discussed in the foregoing chapter on general vocabulary. First, there is the question of what words are essential, and second, the matter of how they can best be learned. These two points will be taken up in order.

DETERMINATION OF SPECIAL VOCABULARIES

The determination of the essential words in any subject follows the methods already described for general vocabulary. A specific example may, however, make the points clearer.²¹ An investigation from the field of history has been selected as an example. In this study twenty-three different textbooks were analyzed to determine which special words a pupil would

be likely to encounter. The procedure consisted in having different people read these textbooks, keeping a record of the number of times each special term occurred. The occurrences of each term for all twenty-three textbooks were then added together and divided by the total number of books, so as to obtain a measure of the average frequency per book. The total number of different terms found in these books was 1,444. The frequencies varied from words that were found only once in the entire 9,000 pages (approximately) to others that occurred over 400 times per book—or about eight times on every nine pages. Obviously, all of these terms could not be of equal importance to the reader. A word occurring only once in 9,000 pages does not contribute enough to the meaning to be worth knowing, so far as history is concerned, while a word that appears constantly must be learned if the reading matter is to be understood. The analysis of these texts provided merely a measure of frequency, not of importance—although importance and difficulty are closely related.

To obtain a measure of importance for teaching the entire list of 1,444 terms was submitted to many teachers of history in junior high school, high school, and college. Each teacher was asked to mark each word with a number, according to the following plan. If a teacher thought a term so important that she could not teach without it, she marked it "3." If she thought it important but not absolutely essential, she marked it "2." If she thought it of some value but not important, she marked it "1." If she thought it of no use in teaching, she marked it "0." These ratings of importance varied just as widely as the frequencies from the previous investigation. Some words were

marked with a "3" by every teacher, while others were marked consistently with a "0."

The investigator had at this point, for each word, measures of frequency and of importance for teaching. Each word was therefore studied in the light of these two criteria. First the words that occurred less than 46 times in all textbooks put together—that is, on an average of not more than twice per book—were eliminated. Those for which the average rating by teachers was between 0 and 1.9 were also crossed off the list. The number of terms left was only 328, or approximately 23 per cent of the original number. Since children begin to read history—under the name of the "social studies"—in about the third grade and continue the study at least through the eighth grade, with probable additional work in high school, it should certainly be possible for them to learn 328 words. If history is a part of their regular work for a total of seven years, they would need to learn something less than fifty words a year in order to master the essential vocabulary, or about one word a week. Actually pupils do not learn these essential words even at the end of six or seven years—probably for two reasons. They do not know which words are essential and which are not, because so many strange words are used in the textbooks they read; also, the individual pupil does not know which words he lacks and therefore does not know what terms to concentrate upon.

The essential technical vocabulary has now been determined for thirteen different school subjects that are taught somewhere between the third grade and the end of high school⁵—arithmetic,^{3, 8} algebra,²² geometry,¹⁸ English composition,¹³ foreign languages,¹⁹ American literature,⁵ hygiene,⁵ general science,¹⁷ chem-

istry,¹⁵ physics,⁷ biology, geography,^{2, 10, 20} and history.^{1, 14, 24} These vocabularies vary from a total of 96 grammatical terms necessary in learning a foreign language—of which 46 have already occurred in English composition—to a total of 520 in high school physics. The lists for each subject are available. If the teacher herself knows what is absolutely essential, the first step has been taken toward a mastery by the pupils of these terms, because she is more likely to emphasize the essentials if she knows what they are than if she does not! Such knowledge by the teacher will not, however, eliminate the necessity of an individual attack upon the problem by each student.

A sample list to indicate the nature and extent of essential technical vocabulary within a subject is given below.⁵

PLANE GEOMETRY*

THORNDIKE
RATING

A. Types of Angles

1. acute angle	—
2. complementary angle	—
3. exterior angle	—
4. interior angle	—
5. 90° angle	—
6. oblique angle	—
7. obtuse angle	—
*8. right angle	—
9. straight angle	—
10. supplementary angle	—

* Various symbols used in this list require description. The star before a word or phrase indicates that this item has already appeared in the arithmetic or algebra list, both of which precede this list. The numbers in the column under "Thorndike Rating" tell in which thousand these words are in Thorndike's list. That is, they tell how

B. Types of Triangles

11. equilateral triangle	—
12. equiangular triangle	—
13. isosceles triangle	—
14. right triangle	—

C. Words used in Describing or Measuring Angles and Triangles

15. adjacent	7
*16. bisect	13
17. coincide	11
18. common	(1b)
19. congruent	20
20. corresponding	4b
*21. degree	2a
22. equivalent	7
23. external	8
24. included	2a
25. opposite	2b
26. similar	3b

D. Words Used in Describing or Measuring Straight Lines

27. equidistant	17
*28. horizontal	7
29. intercept	8
*30. intersect	12
31. locus	0
32. midpoint	0

much support a word is likely to receive from general reading. Each of the first five thousand words on Thorndike's list has been divided into halves; thus a rating of 2a means that a word occurs in the first half of the second thousand, while a rating of 4b assigns a word to the second half of the fourth thousand. The dashes (—) occur opposite all phrases and symbols, since only single words are included in the Thorndike list. A zero rating means that the single word concerned has a frequency somewhere outside the commonest 20,000. The ratings that appear in parentheses, such as the (1b) after "common" are so printed to call the teacher's attention to the fact that the word owes its high frequency to its nontechnical meanings; such words present special difficulties, not because they are unknown but because they are known.

*33. parallel	4b
*34. perpendicular	8
*35. segment	7
36. transversal	0
*37. vertical	8

E. Geometrical Figures and Words Used in Their Description

*38. figure	(12)
39. hexagon	11
*40. parallelogram	16
41. polygon	19
42. quadrilateral	19
*43. rectangle	5b
44. rhombus	0
45. regular polygon	—
46. trapezoid	19
*47. triangle	6
*48. area	3a
*49. altitude	6
*50. base	1a
*51. diagonal	9
*52. hypotenuse	19
53. legs	(1b)
*54. perimeter	20
55. vertex	6
56. vertices	0
57. arc	7
58. chord	7
*59. circumference	8
60. circumscribe	12
*61. diameter	8
62. inscribe	8
*63. pi	0
64. radii	20
*65. radius	8
66. secant	0

67. semicircle	13
68. tangent	16

F. Words Used in Proofs

69. absurdity	9
70. axiom	16
71. construction	4a
72. converse	5a
73. corollary	16
74. demonstration	7
*75. directly proportional	—
76. geometric	13
77. given	1a
78. hence	2a
*79. inversely proportional	—
80. original	5a
81. plane surface	—
82. proof	2b
83. prove	1b
84. proposition	5b
85. respectively	5a
86. symmetry	11
87. theorem	15

G. Symbols

*88. =
*89. +
*90. —
*91. \times
*92. \div
93. \parallel
94. \triangle
95. \perp
96. \odot
97. \square
98. \square
99. \angle
100. \triangleleft

101. \therefore
 102. $>$
 103. $<$
 104. \cong
 105. \angle
 106. $^{\circ}$
 107. \frown
 108. $:$
 109. π
 110. $"$
 111. $'$

H. Additional Words Borrowed from Arithmetic or Algebra

*112. add	1a
*113. center	1b
*114. circle	1b
*115. denominator	20
*116. difference	1b
*117. dimensions	7
*118. direction	2a
*119. distance	1b
*120. divide	1b
*121. equation	8
*122. equal	1b
*123. extremes	(2b)
*124. formula	6
*125. height	1b
*126. length	1a
*127. means	(1a)
*128. measure	1a
*129. minute	(1b)
*130. multiply	3a
*131. numerator	—
*132. product	2b
*133. proportion	3b
*134. quotient	9

*135. ratio	7
*136. second	(1a)
*137. size	1b
*138. square	1b
*139. substitute	4a
*140. subtract	6
*141. sum	2a
*142. width	3a

This list of essential words is by no means long, even as it appears, because 60 words out of the 142 have already been met in elementary school arithmetic. Some of these will certainly be known at the beginning of the course in geometry. If the customary year is spent in learning plane geometry, the pupil who already knows those terms used in arithmetic would need to learn only two words a week. Even if no word on the list was known at the beginning of the year—an improbable situation among high school pupils—there would still be less than four words to be acquired each week in order to master the fundamental vocabulary of this highly technical subject. The usual failure to learn these terms is not due to lack of ability; since the average first-grade pupil learns 480 words in a year, it is ridiculous to suppose that a high school student cannot in the same period learn 142 in a single subject. The problem is again one of educational engineering; that is, the pupil must know what words are needed for the subject, and he must know which of these are—for him—unknown.

1. *Textbooks and Vocabulary*: Modern writers are learning to concentrate their technical vocabulary, omit the literary flourishes, use simple words, and delete topics that are too difficult for school children.

This development is, however, only in its infancy. The most common situation is illustrated by the results summarized in a table which shows the frequency of technical terms in a single textbook. Of these 1,097 words, 695—or 63 per cent—appeared only once or

TABLE IV

SHOWING THE DISTRIBUTION OF FREQUENCY OF TECHNICAL TERMS
APPEARING IN A SINGLE TEXTBOOK

Number of Occurrences	Number of Terms	Number of Occurrences	Number of Terms
500+	2	70-79 . . . . .	..
475-499 . . . . .	..	60-69	3
450-474	1	50-59	2
425-449	1	40-49	5
400-424 . . . . .	..	30-39	3
375-399	2	25-29	8
350-374	1	20-24	3
325-349 . . . . .	..	15-19	6
300-324	3	13-14	11
375-299	2	11-12	18
250-274	1	9-10	39
225-249 . . . . .	..	7-8	47
200-224 . . . . .	..	5-6	72
175-199	4	4	70
150-174	2	3	92
125-149 . . . . .	..	2	306
100-124	1	1	389
90-99	2	.. . . . .	..
80-89	1	.. . . . .	..

Total number of
different terms . . 1,097

twice. Approximately 80 per cent were used less than five times apiece. Of the entire number, only 82—or 7 per cent—occurred more than 10 times in the entire book, which was 408 pages long. Thirteen words were important enough to be used on an average of at least once on every other page.

Most of the vocabulary burden comes from hundreds of hard words used so seldom that a pupil has no chance to learn them. In this particular book, the vocabulary is spread out so thinly that few terms are likely to be learned. Moreover, the inclusion of many hard words of low frequency obscures the really important words. In fact, both teacher and pupil are usually confused as to what the essential terms are. The first step toward an efficient mastery is the determination by research of what is and what is not important. Eventually the writers of texts will produce better books but in the meantime a list of essentials will help everyone to concentrate upon what is most needed.

MASTERY OF TECHNICAL VOCABULARY

On page 163 are some simple results from two studies. In one,¹⁶ the development of 243 mathematical concepts (in arithmetic, algebra, and geometry) was traced from the third through the twelfth grades; in the other,²³ 346 concepts in social science were similarly studied, from the fourth grade through the twelfth. In these two investigations the terms had already been selected, in the manner above described, as being essential. The results from both studies were expressed in terms of the per cent of children in each grade who were able to recognize the meaning of each technical term. The children did not write their definitions; they merely picked out the correct one. The test required, therefore, about the same degree of understanding that would be necessary if the children were reading these terms in a textbook. A few sample

results from both arithmetic and history are given below.

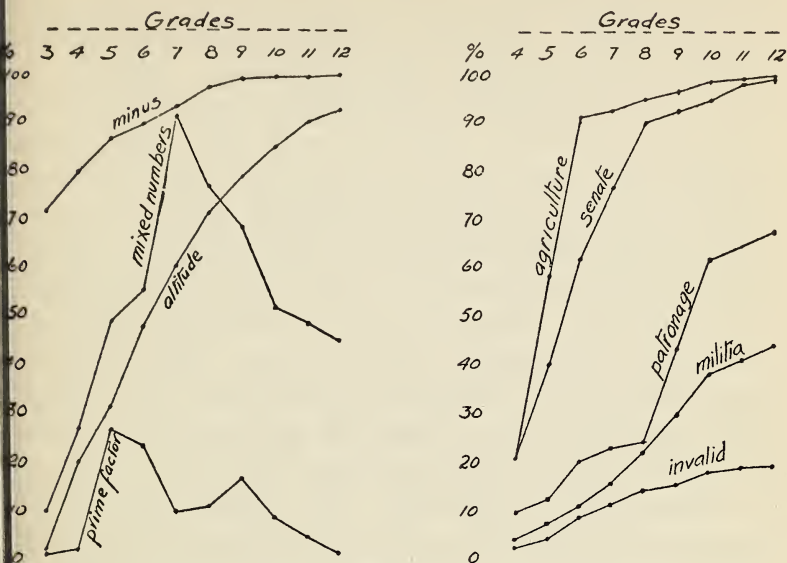


FIG. 10.—Mastery per grade of technical vocabulary in two fields.
(Pressey²³ and Moore.²¹)

The word “minus” was already known by over 70 per cent in the third grade. Its growth was not complete, however, until the ninth grade, at which time all the pupils recognized its meaning. The curve here given is, of course, merely the top of a learning curve which has its beginning in the first and second grades. The word “altitude” started in the third grade as practically unknown. Year by year a few more children acquired meaning for this word until, in the twelfth grade, 92 per cent could recognize the correct definition. Even at this level, however, eight pupils in each hundred did not know that the altitude of an object meant the distance from its base to its

top. A third type of learning curve is illustrated by the term "mixed number." This phrase is not used outside the arithmetic class and is used for only two or three grades even there. It receives, therefore, little reinforcement through daily experience, either in or out of school. Starting with 10 per cent of the third grade, the mastery increases to 91 per cent in the seventh; but from then on, there is a rapid decrease, ending at 44 per cent for the twelfth grade. This example shows what happens to knowledge of a technical word, even though it is once thoroughly learned, if it is not used. The last curve in this table shows the result for the phrase "prime factor." This curve is presented, not to illustrate learning—of which there was very little—but to show the sad results of trying to teach a word to children when they are too young to understand its meaning. The highest degrees of mastery are in the fifth and sixth grades, in which the term is usually first encountered. The little learning thus acquired is soon lost. Then, in the eighth and ninth grades there is a slight relearning, presumably in general mathematics or algebra. From that point on there is further forgetting, with a final achievement in the twelfth grade of only 4 per cent. The concept of the prime factor is far too difficult for children to understand. If it were never presented before the ninth grade, the final learning would undoubtedly be higher. Any high school teacher of mathematics knows that the concept is hard enough, even in high school; it has no place in the lower grades.

The second graph shows five learning curves taken from the history results. The word "agriculture" is learned early and not forgotten; "senate" shows a high achievement as early as the ninth grade and al-

most complete recognition by the twelfth grade. The other three words show an inadequate degree of mastery at the end of school. The term "invalid" undoubtedly owes its lowly status to negative transfer from its everyday to its technical meaning. A word with two uses is always harder to learn than one with a single meaning.

For the arithmetic terms the average mastery at the end of high school was 88 per cent; for the algebra terms, it was 11 per cent; for the terms in plane geometry, 46 per cent. The words from history and geography showed an average mastery of 90 per cent in the twelfth grade, but the range was from 20 to 100 per cent. In spite of the relatively high final standing, 96 essential terms in social science were known by less than 75 per cent and 19 by less than 50 per cent. It is no wonder that even high school pupils cannot read their textbooks when their knowledge of the constantly recurring terms is so low.

The gains shown by the above graphs and averages are not, however, all real. In interpreting them one must remember that a good deal of elimination has occurred from the eighth grade on, if not earlier. The dullest of the children have dropped out of school as soon as they reached an age at which they could legally do so; children from the poorer families have either gone to work or entered a trade school. The pupils in each successive grade constitute, therefore, a more select group, with a higher general level of intelligence, than existed in any earlier grade. The curves and averages would all rise to some extent, even if no learning whatever took place, because of this continual elimination in the lower end of the distribution of ability. The degree of learning above

shown represents, then, the knowledge of special vocabulary by those children who are bright enough to finish high school; but even these pupils do not know enough technical words to understand the textbooks they are required to read.

Many teachers do not realize how completely lacking in technical vocabulary some pupils are. A few examples may emphasize this point.

One day a college student, who was failing his work in first-year language, stopped after class and said to his instructor: "I think I'd understand this work better if I knew what this 'plural' was that you've been talking about." This boy was not stupid; he had simply never been informed about linguistic matters. He did not even know the words "verb" and "noun." It might seem that his ignorance was too profound to be remedied in less than a year or two. Actually he achieved the fundamental vocabulary necessary for first-year language in three weeks and had no further difficulty with his work.

Mabel was a bright child who had a fixed idea that she could not learn to solve problems in arithmetic. She could do good work as long as she stuck to the operations by themselves, but even the shortest verbal problem threw her into a complete state of disorganization. Mabel was asked to read a few problems aloud. At once the nature of her difficulty appeared. She did not recognize most of the special words. Her teacher had given her no work in phonics, and she was quite unable to pronounce unfamiliar words. Mabel was given ten minutes of individual work in phonics every day. After about three weeks the special terms in arithmetic were introduced as training materials. In three months' time Mabel was no longer afraid of problems, and a year later she

stood among the first ten pupils in her grade on a test of problem-solving. No other remedial treatment than that described above was used.

A student in first-year chemistry stayed after class one day and asked his instructor to give him extra help in understanding the law: "the volume of a gas is inversely proportional to its density." The instructor tried to explain, but without success. After some time he did what he should have done in the first place. He asked the student to define the terms being used. To his amazement he found that the boy had "volume" confused with its meaning as a book, thought that "gas" meant what is used in a stove, and had omitted the phrase "inversely proportional" because he had not the foggiest notion of its meaning. "Density" he defined only as "thickness." It is not surprising that the law was hard for him to grasp, although he had carefully memorized it and had studied it until he was dizzy from reading and rereading the paragraphs above and below it.

Any experienced teacher who has really studied her pupils can duplicate such instances. The significance is not always appreciated, however. The first and sometimes only explanation that occurs to the teacher is that the child is stupid. Lack of technical vocabulary often means only that a pupil has not yet been adequately informed. He can learn although he has not done so.

CLASSROOM TEACHING OF TECHNICAL VOCABULARY

No teacher of history, algebra, chemistry, or any other subject should assume that pupils can read the

textbooks assigned to them. Each one must, either through her own observation or through use of a standardized list, isolate those terms that are important; then she must deliberately teach them. As stated above for general vocabulary, the time to teach children these terms is before they meet them in reading, not after. Ten minutes spent at the beginning of each class in explaining whatever special words are required for completing the next day's reading assignment will permit the children to read at a far higher level of comprehension than would otherwise be possible. The teacher should define these new words, illustrate them, point out how they are spelled, read aloud relevant sentences from the text, or use any other means for impressing their meaning upon the pupils. After this introductory work, the problem of acquisition becomes so individual that further work with the class as a whole is largely a waste of time. Part of the following chapter will deal with the diagnosis and individualized instruction that is needed in case the original class drill does not lead to adequate mastery.

S U M M A R Y

All textbooks in the content subjects use an assortment of special terms. In general, too many such words are used. For most subjects, the core of absolutely essential terms is now known. This irreducible minimum has been determined by painstaking work and weary hours of research. Any teacher who wants to do so can obtain a list of the special words in her field.* With this list to guide her, she will find that she

* If other sources of supply fail, such lists can be obtained from the writer.

can make much better progress than ever before. Without some such guide her pupils are likely to be greatly handicapped in their efforts to read their textbooks.

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X

DIAGNOSIS AND REMEDIAL WORK IN VOCABULARY

THE fundamental difficulty encountered in teaching vocabulary is that there are altogether too many words! For instance, the average ninth-grade child's reading vocabulary contains nearly 8,000 words. A teacher obviously cannot test even a single child to determine his understanding of every one of these terms. In fact, so far as general vocabulary is concerned, the teacher is thoroughly swamped by the multiplicity of words, any one of which a given child may not know. In technical vocabulary the problem is not so extreme, because the total number of terms is smaller. In either field, however, it is necessary to delimit the number of words to be learned until the total is reduced to a manageable size.

Although the details vary somewhat, the techniques for dealing with the child who does not know enough words are fundamentally the same for both general and technical vocabulary. The first step is always to determine definitely just which terms are to be taught in any given class or grade. The second is to devise types of drill that will help in vocabulary building and will stimulate a real interest in word study. The third step is to analyze the deficiencies for those whose vocabularies are inadequate. Finally, individualized drill is necessary for remedying the defects

revealed by analysis. Because the work is so similar in both general and technical vocabularies, suggestions for work in both fields are combined in this chapter.

DIAGNOSIS AND REMEDIAL WORK IN GENERAL VOCABULARY

1. *A Co-operative Plan:* In order to carry out a plan of analysis it is necessary for the teachers within a given school system to work in close co-operation, with a perfectly definite understanding as to which words each teacher is to make herself responsible for. Without such an exact arrangement as is suggested below, each successive teacher finds herself responsible for analyzing each child's entire vocabulary to date. Such a situation is so obviously impossible that teachers in general, are inclined to neglect word study, or at the best to give it only incidental and sporadic attention. A teacher who wishes to develop adequate general reading vocabularies in her pupils will find it necessary to make an individual diagnosis of the poorest readers. The plan outlined below is recommended as a useful means by which the teacher of each grade can contribute her particular unit of analysis for as many pupils as may need it. To be effective, this work should be initiated in the low second grade and then continued with the same class in subsequent grades.

In essence the plan is simply this: Each teacher from the low second through the high eighth grade makes herself responsible for the analysis and remedial teaching of 250 (grades L2-H3 and L7-H8) or 500 words (L4-H6) in the course of a semester. To bring about complete agreement as to which teachers

are to analyze knowledge of which words, it is suggested that the successive teachers cover the following groups of words taken from the Thorndike list.

GRADE	WORDS FROM "TEACHERS' WORD BOOK"	NUMBER OF WORDS
L2	1a: Initial letters A-M	250
H2	1a: Initial letters N-Z	250
L3	1b: Initial letters A-M	250
H3	1b: Initial letters	250
L4	2a	500
H4	2b	500
L5	3a	500
H5	3b	500
L6	4a	500
H6	4b	500
L7	5a: Initial letters A-M	250
H7	5a: Initial letters N-Z	250
L8	5b: Initial letters A-M	250
H8	5b: Initial letters N-Z	250

This division of words delimits the analysis to a manageable amount and still covers the 5,000 most essential words in the language.

To complete her share of this work, each teacher first makes a set of vocabulary cards for use in her analysis. She copies from the *Teachers' Word Book* those words that fall within the limits set out for her by this plan. She prints each word on a separate library card. These cards are not marked in any way and become part of her permanent equipment. From one to two hours are required to prepare these materials, which can be used with different classes for several years.

Before a teacher begins testing she should tear up several sheets of paper into small slips. Then she begins to test the poorest reader in her room. She shows him each card individually. If he recognizes the word

at once, he obviously knows it. Even if he stumbles a bit in pronouncing it but eventually gets the meaning by his own efforts, she can assume the word to be well enough known for recognition. Any individual child—even the poor reader—will know from a half to two-thirds of the words. There will be some that he does not know at all, some that he identifies incorrectly, and some that he seems confused about. Each time such a word appears, the teacher should write it down on a slip of paper, one word to a slip. As the analysis proceeds, the pile of slips grows. When the teacher has been through her entire assignment of words, she has recorded upon the slips of paper those unknown to the child in question. These slips form, then, his learning task in vocabulary for the rest of the semester. He is to get meanings for them and sort them over until he has drilled himself upon them; he is to keep the slips for his second test at the end of the semester.

This analysis takes so long—from one to two hours per child—that it cannot be carried out for more than a few children. Out of a room of thirty-five, not more than five or six can be thus studied. Naturally, the work is done in small doses; when the pupil shows fatigue, it is time to stop. This analysis can best be done during free-reading periods while the other children in the room are occupied. For the second and third grades, the problem of teaching the words to individual pupils can best be solved by pairing each pupil, at the end of his analysis, with one of the best readers in the room. Since the words have been so assigned as to be below even the average mastery in the grade concerned, the best readers will know practically all of them. They are quite capable of giving the necessary drill.

The teachers of the second and third grades will certainly have to present the words on cards and let the child pronounce each. Beginning in the fourth grade, however, simple tests may be used—either with the entire class or with the lower third of it. Such items as the following five, from the first half of the third thousand in the *Word Book*, are recommended.

1. What does *hop* mean? to call to run to laugh
about something to jump around to study
2. What does *foundation* mean? the side the top
the under side the back the bottom
3. What is a *dove*? a kind of bird a kind of
house a kind of toy a kind of deer a kind
of tree
4. What does *bathe* mean? to cry to play to
wash to learn to walk
5. What is another word for “*agriculture*”?
shipping farming handwriting subtract-
ing preaching

During the first week of school the teacher can give a test, including perhaps twenty-five such items. The children can score one another's answers, marking those that are wrong. Each child then prepares as many blank slips of paper as there were failures on his test. Onto one side of the slip he copies from the test the word being defined; on the other side, he copies the correct definition. He then throws the test paper away and keeps his little pile of slips, which he subsequently studies from time to time, sorting them into two piles according to whether he does or does not now know the meaning of each word. In junior high school this type of work can best be done in the required English class. The test used can present fifty

or sixty words at a time, since the children are older. For all grades in which tests can be used at all, the best procedure is to test recognition of a relatively small number of words—not over fifty—isolate those unknown to each individual child, provide study periods for learning these words, be sure they are learned, and then start the next fifty. This kind of vocabulary drill need not occupy much class time. It is probably better to finish one series of words and then let a little time elapse before starting another than to continue the work without intermissions.

By means of such an analysis it is possible for the entire group of teachers in a school system to analyze the vocabulary defects of individual pupils. Without the indicated degree of co-operation and without the assignment of particular words to particular years, the problem is practically insoluble with any degree of thoroughness.

2. *Various Remedial Exercises*: The plan just outlined requires the co-operation of elementary school teachers from Grades 2 through 6 and of English teachers in junior high school. If such an arrangement can be carried out, the exercises described below are not especially needed, although they may be used to give variety to the work. If a teacher has to work by herself, the best she can do is to use class drill to present new words before stories or other assignments are read, plus as much individual work as possible, and as many of these exercises as she can devise for use by those pupils whose vocabularies are low. She will not want to use every type of exercise in every grade; some are too childish for upper-grade pupils, and others are too hard for primary-grade children. Even though the exercises do not cover fundamental

reading vocabulary with the thoroughness of the plan described, their use will develop a larger store of words than the poorer readers as a group are likely to develop without such training.

(1) The earliest form of remedial work consists of an arrangement by means of which children can drill themselves in phonograms. A useful form for this instructional material is illustrated below.



FIG. 11.—Illustration of drill booklet.

What the pupil does is to sound the consonant on the first small page at the left with the phonogram, which is always kept visible. Then he turns over to the second page of the little booklet and sounds this new consonant, or combination of consonants, with the phonogram. He continues through the pages of the booklet until he has sounded all of the words. Then he goes back to the beginning and does it over again. Over 100 such booklets can be made. When a pupil thinks he can sound each word in a booklet, he takes it back to the teacher's desk and gets another. Even as early as the second grade, pupils can drill themselves in this way. If desired, they can work in pairs and check each other. Naturally, not every word is sounded correctly, but most of them will be; the pupil's vocabulary consequently grows. Children enjoy this exercise

and will give themselves constant drill without any special urging. The most useful phonograms are listed below.

ab	ank	eal	est	ine	og	ow
ack	ang	eam	et	ing	oil	own
ad	ap	eat	ew	ink	oke	oy
ade	ape	eck		ip	one	
ag	ar	ed	ice	ipe	ong	ub
aid	are	ee	ick	ire	ook	uck
ail	ash	eed	id	ist	ool	ug
ain	ass	EEK	ide	it	op	um
air	at	eel	ift	itch	ope	ump
ake	atch	een	ig	ite	ore	un
ale	ate	eep	igh	ive	orn	unch
all	ave	eet	ight		ose	ung
am	aw	ell	ile	oad	oss	unt
ame	awl	en	ill	oat	ot	ush
amp	ay	ench	im	ob	ote	ust
an		end	ime	ock	ought	ut
and	each	ent	in	od	ound	
ane	eak	ess	ind	oe	out	y *

(2) A second type of exercise is equally simple. A teacher selects about fifteen names of common objects for which she can easily find pictures. One exercise may contain names of animals; another, names of flowers; another, names of trees; another, games; another, toilet articles; and so on. The pictures are first cut from advertisements and pasted on to a single sheet. The nouns are printed on slips of cardboard, about an inch wide and four inches long. A pupil gets Exercise 1 and Picture 1 of this series. He studies both the words and the pictures. Then he places each

* The writer is indebted to Miss Minnie McKean of Haight School, Alameda, California, for both this list and the arrangement for drill shown in Plate 11.

slip on top of the picture it matches. When he has finished, he signals the teacher. If his work is correct, he puts the slips back together inside an elastic and returns both cards and pictures to their proper places. Then he gets another set of cards with the appropriate pictures and proceeds as before. If a child has made mistakes in matching his first set of pictures and words, the teacher corrects the errors, goes over the unrecognized words, shuffles the slips into a different order, and tells him to repeat the same exercise. The checking, teaching of unknown words, shuffling, and retaking are continued till all words are matched with the correct pictures. Then the pupil returns his materials and starts another exercise.

A variation on this same exercise consists of using a single picture showing several articles. Each slip contains the name of one object in the picture. The slips are then laid upon the appropriate objects.

(3) A third type of self-administering exercise requires from eighteen to thirty small cards—library cards cut in half are excellent. Each pack of these cards should contain words dealing with three topics. For instance, a single pack might include the following words:

FARM	SCHOOL	AUTOMOBILE
pig	desk	tires
hay	teacher	horn
carrots	book	motor
horse	eraser	seat
barn	pencil	driver
corn	lesson	gasoline
farmer	class	car

The top card of the pack lists the three main themes. The pupil simply sorts the cards according to topic.

If he is successful, he returns them to their proper place and gets a similar pack, dealing with three other subjects. If he makes mistakes, the teacher corrects them, shuffles the cards, and tells him to try again.

(4) A slightly more difficult exercise consists of a sheet of paper on which are typed lines like the following:

1. cat mouse dog chair rabbit
2. yellow blue funny red green
3. jump run hop skip think
4. gun paper kill shoot war
5. game sheet blanket mattress springs
6. clown elephant school circus tent
7. lovely beautiful pretty handsome ugly

The child is to copy off onto a sheet of paper the numbers of the lines and, for each line, the word that is "different" from the other four. He then compares his work with a score sheet, studies his errors, puts the sheet away, gets another, and records the new sheet in the same way. A teacher can use as many of these sheets as she is willing to make. It is best to choose the words for any given sheet from the same half of the same thousand in the *Teachers' Word Book*; in this way, the difficulty of each sheet can be estimated and the series arranged in order from easy to difficult.

(5) A fifth exercise is also based on the Thorndike list. Each exercise consists of a sheet on which groups of words and their definitions appear. Each group should contain not more than five or six words; a larger number produces chiefly confusion and eye-strain. A sample exercise, presenting words from the upper half of the fourth thousand of the *Teachers' Word Book*, appears on page 181.

DIRECTIONS: Look at the words in each group at the left. Then find the meaning of each one in the list of definitions at the right. On your record sheet, write down the numbers from 1 to 20. After each number, write the letter of the meaning that fits each word. You do not need to copy either words or meanings. The definitions for each group of words are right beside the words; do not use definitions from one group with words from the group above or below.

- | | |
|----------------|--|
| 1. novelty | a. the round top of a building |
| 2. kite | b. a group of boys who sing together |
| 3. hoe | c. something new |
| 4. dome | d. a child's toy |
| 5. chair | e. something to dig with |
| 6. hamlet | f. to throw away |
| 7. fling | g. the very top of something |
| 8. peak | h. a place where one can buy food |
| 9. visible | i. something that can be seen |
| 10. restaurant | j. a very small village |
| 11. yawn | k. to shout loudly |
| 12. stupid | l. a large cloth |
| 13. towel | m. in a hurry |
| 14. hasty | n. to open the mouth wide |
| 15. bellow | o. not bright |
| 16. violate | p. something you want to do but should not |
| 17. maple | q. a sheep's wool |
| 18. fleece | r. to succeed in doing what you try to do |
| 19. temptation | s. a kind of tree |
| 20. achieve | t. to break a promise |

The child is, first, to copy down on a separate sheet the numbers of the words to be defined. Then he reads the definitions and copies down after each number the definition he thinks fits the word. Each of the four or five sections on the page must be a self-contained unit. When the child has finished, he compares his answers with the score sheet and marks his errors. Then he studies the words he did not recognize and learns their meaning. Either the teacher or another pupil should check the learning of these new words before the sheet is returned to its proper place. It is best to select the words for any single sheet from the same half-thousand or thousand of the *Teachers' Word Book*. The exercises in the series may then be arranged in order of difficulty.

(6) In the third and fourth grades, pupils should learn how to divide words into syllables. A series of exercises for this purpose can easily be made. On each of a set of perhaps twenty library cards a teacher writes a polysyllabic word, taken preferably from the regular reading matter of the grade. On the back of the card she divides the same word into syllables. The pupil who works at this exercise takes a package of such cards to his desk, looks at the first word in its undivided form, and copies it onto a sheet of paper, dividing it into what he thinks are correct syllables. At the end of the exercise, he turns the cards over, checks, and corrects his work. He then puts the package back together again, returns it to its proper place, and gives the teacher his record, which shows how many words he divided correctly. The teacher needs several such packages of cards so that a pupil can receive as much training of this sort as he requires. The ability to divide into syllables is essential in learn-

ing how to get acquainted with an unfamiliar word, because it enables one to break it down into pronounceable units.

(7) In about the sixth grade, or at any subsequent time, pupils are helped by being given specific drill on prefixes and suffixes. Below are listed those forms that are of sufficient frequency to be learned.

PREFIXES ¹

ab-	intra-
ad-	mis-
ante-	per-
anti-	post-
be-	pre-
circum-	pro-
co-	re-
contra-	retro-
de-	sub-
di-	super-
e-, ex-	trans-
for- (fore =)	ultra-
in-	un-
inter-	with-

SUFFIXES ¹

-acy	-ism
-ade	-ist
-age	-ite
-al	-ive
-ance	-ize
-ard	-less
-ate	-by
-ble	-ment
-ed	-most
-ence	-ness
-er	-or
-ern	-ous
-ess	-ship
-est	-sion
-ful	-ster
-ice	-tion
-id	-tude
-ing	-ure
-ish	-y

The materials for this exercise are simple enough to prepare. The teacher simply writes, one to a card, the prefixes and suffixes listed above. Below each item she writes two or three familiar words illustrating the use of the prefix or suffix. On the back of the card she writes the meaning of the word element being studied,

plus meanings for the sample words if she wishes. The two sides of a card appear below:

<p style="text-align: center;"><u>trans</u></p> <p>transport transmit transatlantic</p>	<p style="text-align: center;">trans - across or over</p> <p>transport - carry across transmit - send across or over transatlantic - across the Atlantic</p>
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FIG. 12.—Two sides of a sample card for vocabulary drill in recognizing prefixes or suffixes.

The pupil studies the cards, observes the examples, and learns the meanings. These exercises form a definite unit of work, because there is only a limited number of prefixes and suffixes that are worth learning.

(8) There are numerous games that can be played with the dictionary as soon as the pupils are old enough to use it. A teacher can, for instance, give a group of pupils a certain number of words, supply each with a dictionary, start them all at the same time, and see how many can get from the dictionary the correct spelling, pronunciation, and meaning of each term. A time limit may be set or not, as desired. Another dictionary game is to give pupils a single word and ask them to find as many synonyms as possible. For example, if the original word is "beautiful," they will find, upon looking it up in the dictionary, various synonyms such as "lovely," "gorgeous," "pretty," and so on. They then look up each of these synonyms and find still more, until they have the entire list of words that could possibly be used as equivalents. Naturally one cannot use dictionary drills too fre-

quently, but an occasional game of either of these types is profitable.

ANALYSIS AND REMEDIAL WORK IN TECHNICAL VOCABULARY

For adequate individual study and remedial work the teacher needs the following equipment: (1) for her own use a list of the essential words in the subject being taught, (2) duplicate copies of this list for each student, (3) an objective test that is "keyed" to the list, and (4) a home-made dictionary. The procedure in using this equipment is straightforward and simple.

The teacher does not need to construct her own list—she can buy one that is based on years of research carried on by many different people. Thus, the high school teacher of a foreign language can obtain a list containing a total of ninety-six terms, of which forty-six have already been encountered in elementary work in written English. She has, then, forty-six words to review and fifty new ones to teach. Since pupils of this age can handle a test fifty items long in one period, she can find out at the end of the first two days which terms, of those that he will soon need to know, each child recognizes. In other subjects it may be desirable to administer the test in several sections, either because there are so many items or because the subject matter naturally falls into divisions, before each of which a brief test can be given.

Whenever the tests are administered, the papers should be collected at once. The test items should always be keyed to the list. That is, Item 16 should measure comprehension of Word 16 on the list; Item 40 should test Word 40, and so on. When a teacher

scores a pupil's test she does not mark the blank at all; she marks the corresponding items on the pupil's copy of the fundamental list. The diagnosis a student receives is a list showing him the entire number of terms necessary to the subject, with a mark against each word he did not know. His learning task consists of finding meanings for these marked words.

Since the most severe problems of technical vocabulary do not begin until junior high school, the children are old enough to guide their own remedial work. Once the teacher has isolated for each pupil the words he does not know, of those that are essential, she should give him definite assignments for learning the missing words and should check him to make certain he does so. The children are mature enough to use an ordinary dictionary, but the task of searching for meanings is greatly simplified if a teacher constructs a "dictionary" for her own course. She numbers library cards to correspond with the numbers of the words on the list. Then she writes, on each card, the appropriate word and some sort of explanation—definition, illustration, graphical representation, or whatever may seem best for making the meaning clear. The pupils consult this dictionary as they need to do so in order to master the fundamental vocabulary. This set of definitions, once constructed, is a permanent acquisition.

At whatever intervals seem desirable the teacher repeats the original test—or a duplicate form of it. Each pupil keeps his checked list beside him and should answer *only those items testing recognition of words he missed on the preceding test*. When the teacher scores this second test, she need not mark the blanks. Instead, she should draw a line through the check mark in front of words missed on the first test

but known on the second. The student's task is then to learn what terms still remain.

By this method, a pupil always knows what words he needs and how many of them he can recognize. He knows how he can get meanings for unfamiliar words. And he can always tell, by looking at his checked list, how much progress he has made and how much work remains to be done. Such a situation motivates a child to reach his clearly recognized goal. Vocabulary drill is, for both teacher and pupil, relatively hard work, although a plan like the one described above relieves some of the monotony. As pointed out earlier, there is no easy road to the learning of any language. There are enough things in schoolwork that are made interesting and exciting for the learner. It will do pupils no harm to be subjected to a little hard work.

ACTUAL EXPERIMENTS IN VOCABULARY BUILDING

Four different experiments—one in elementary school, one in high school, and two in college—will be summarized briefly to show that training in vocabulary produces results.

(1) In the first experiment an elementary school teacher, working under the writer's supervision with a class of 26 poor readers in the fourth and fifth grades, used the type of drills in general vocabulary already described in the section on remedial work. Before the training began, these pupils took a vocabulary test based on the *Teachers' Word Book* in which they showed an average general vocabulary of 1,600 words. These pupils were in the remedial reading class for the first 50 minutes of each school day. Their work

was in large measure individualized. The experiment started so late in the year that it could run for only seven weeks. At the end of this time a second vocabulary test was given. The result showed an average vocabulary of 2,500 words. This increase is equal to slightly less than a year's gain by usual class work. The teacher did not know what words would be used for the final testing, and there was no way by which she could have found out.* The gain is therefore due to the training procedures and not to any drill by the teacher on the particular words that would appear on the final test.

(2) During the school years 1932-1933, an experiment was carried on in a small high school class in geometry.⁶ There were 46 pupils, with I.Q.'s ranging from 87 to 169. On September 11 these students took an objective test which covered approximately the special words listed in the previous chapter. The test contained 121 items. The average score was 56, with a range from 26 to 101. The teacher of this class had prepared a self-made dictionary of the type above described. Each student was told what terms he had missed and was given opportunity to study them. From time to time, at intervals of about 6 weeks, the pupils tested themselves or each other. On February 8, the teacher repeated the original test. The scores now averaged 105.5, with a range from 86 to 121—a perfect score. The lowest score in February coincided with the third from the highest in September. The study of unknown words continued. After another 6 weeks had passed, the teacher gave the original test once again, on March 24. The average was 119, with scores run-

* The tests were not even constructed until the day before they were administered.

ning from 106 to 121. A condensed form of the September and March distributions appears below:

SCORE	26- 35	36- 45	46- 55	56- 65	66- 75	76- 85	86- 95	96- 105	106- 115	116- 121	MEDIAN	NUMBER OF PUPILS
September . 3		10	9	9	6	5	3	1			56	46
March . .									12	34	119	46

The standing of the entire group had risen greatly. Even more conspicuous is the marked narrowing of the range. As in all diagnostic work, the chief effect showed at the lower end of the distribution—precisely where it is most needed. These students more than doubled their original mastery of technical vocabulary in this subject.

(3) The third experiment ² deals with a class of second-semester college freshmen, each of whom had made average scores in speed of reading, but relatively low scores in comprehension. Moreover, all students had failed at least one course during their first semester. Most of these students had low ratings in intelligence also, but as it later appeared on a retest after the training described below, these low ratings were due primarily to inadequate vocabulary rather than to an innate lack of ability. These students felt that their lack of understanding and their resulting poor work in college classes were due in large measure to the inadequacy of their reading vocabulary. Each student, therefore, selected one course in which his work was either failing or barely passing, and concentrated upon reading the textbook for this course. He was supplied with library cards, on which he wrote daily the unfamiliar words he found in his assignments. Each day he used ten to thirty of these cards, depending upon how many unknown words he met. Whenever one of these words recurred, he made a

check mark on the card on which it was already listed. By this means, he obtained a measure of frequency and could tell which words to look up first. The students used the dictionary to find meanings for their words and wrote the definition of each upon the back of the library card. Usually the class periods were alternated, one day reading and the next day work with the dictionary. Most of the studying needed to learn these new words was done outside of class. The students numbered serially the library cards for which there was a definition written on the back. The cards containing words they did not have time to look up were either thrown away or put in a separate place. The completed cards were kept throughout the semester. At the end of the course, the instructor took each student's pile of cards in turn, shuffled them, and asked for oral definitions. A few students knew every meaning they had studied; of course some had listed words and definitions without ever learning them. The number of words actually learned varied from 310 to 874. The gain in vocabulary was large, but the gain in comprehension was even greater. Not one of these fourteen students failed the course for which he had studied the textbook in this analytic way, and only three failed any course at all.

(4) Even without such detailed and individual work it is possible to bring about an appreciable improvement in the size of a student's vocabulary.³ In one experiment 7 sections of college English enrolling 196 students were given special drill in vocabulary. This work took up 10 or 15 minutes of each class meeting. Seven other sections enrolling 233 students were given no special vocabulary drill but received otherwise the same training in freshman English. At the

beginning of the quarter the experimental and control sections showed general reading vocabularies of equal size. At the end of the quarter the control sections had gained an average of only 17 words while the experimental sections showed an average increase of 141 words. These students were all enrolled in a course which continued throughout the academic year. At the end of the spring quarter the vocabulary test was repeated. During the winter and spring quarters no special work in vocabulary was done in any of the sections. So far as was possible all sections were trained alike. At the end of the spring quarter, however, the students who had received special vocabulary drill during the fall still retained the same superiority over those who had not received such drill.

In this experiment all training was given in class. The amount of time devoted to it was relatively small. The results, therefore, while appreciable, were naturally less than those obtained by a more individual approach and longer periods of work. Even with the usual classroom methods, however, a teacher can bring about some improvement in general vocabulary, with a reasonable expectation that the improvement will be permanent.

S U M M A R Y

Work in vocabulary is fussy, exacting, and relatively hard to motivate. The progress made under group methods of instruction is small and discouraging, because training in vocabulary is not easily or well done by any but individual methods of work. It is, however, possible to bring about a great interest in words and a resulting increase in the acquisition of them if one approaches the matter through games and self-

administered exercises. The added degree of comprehension more than repays a pupil for the work involved.

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PART IV

READING COMPREHENSION

XI

COMPREHENSION

READING is a highly synthetic process whose end-result is comprehension. If a pupil's eye movements function correctly, if he recognizes the meaning of separate words and phrases, if he remembers what he reads in successive paragraphs, if he has the necessary background of information, and if he has sufficient interest to attend to his reading, he will achieve an adequate degree of comprehension. If anything goes wrong with a single contributing element, the level of comprehension is at once lowered; if there are several defects there will be little or no understanding of what is read. Since any child is, at best, only a beginner in the task of getting meaning from the printed page, he is more likely than not to strike a snag somewhere in such a complicated procedure. His eyes have not yet been trained for accurate and efficient work, his memory span is short, he finds dozens of new words every day, he often has no interest in the subject matter assigned to him, and he has an extremely small amount of experience by which he can interpret what he reads. It is therefore not surprising that his comprehension is often inadequate. Unless one is dealing with defective children a failure to comprehend is not usually due to inadequate intelligence.

Requires comprehension

There are various levels of comprehension. The

lowest has been achieved when a pupil can give a reasonably accurate summary of a story, without any interpretations, comments, or insight. This level is usually reached by the third grade. Throughout elementary school, comprehension occasionally shows greater depth than a mere surface understanding of the events portrayed by a story. Children are thus able to draw obvious conclusions as to the character of persons in a story, their reasons for behaving as they did, or the moral to be derived. A teacher should not, however, expect elementary school pupils to show any real insight. She should be satisfied with a clear and simple summary of the main points. An occasional child will add interpretations or some appreciation of an inner meaning, but for the most part "the primrose by the river's brim" remains simply a primrose to children.

In junior high and high school a teacher can reasonably expect an increased depth of comprehension. The average pupil should be able to form some estimate of character, to guess at motives, and to be sensitive to meanings which are implied but not expressed. For the first time, pupils may see *Pilgrim's Progress* as something more than lurid adventure and *Gulliver's Travels* as something more than a fairy story, while *Alice in Wonderland* may lose its nightmarish quality and become funny. There is naturally a wide range of variability in the capacity for seeing such inner meanings. The person with a literal and practical mind may miss such meanings throughout his life. In any case, real depth of understanding should not be expected from anyone before the last years of high school, because such comprehension rests upon years of living and experiencing.

FACTORS INFLUENCING
COMPREHENSION

The comprehension of any given story or other unit of reading matter is directly related to a number of factors, most of them fairly obvious. The first is the general intelligence of the pupil. The more intelligent he is, the more likely he is to understand what he reads, unless he has some specific defect which interferes with his work. The more interested a pupil is in his book, the more likely he is to understand it. Interest is not, however, absolutely essential for comprehension. Pupils can and do understand, every day of their lives, matters in which they have no interest whatever. Interest acts mainly as a driving force. The relationship between it and comprehension is probably due to the greater background of information one has in those fields in which one is interested. If a boy is interested in automobiles, he will ask questions about them, talk about them, read about them, and acquire a considerable fund of factual information; he will also surround the automobile with a halo of dreams and ambitions. As a result, he is well equipped to read about an automobile trip or even a description comparing the efficiency of two different motors. Interest acts, therefore, both directly as a motivating power and indirectly by furnishing a background of information. This necessary background may be developed through daily contacts, however, whether interest exists or not. Thus a pupil who lives on the seacoast inevitably learns a great deal about shipping and fishing and has therefore a better background for understanding a story of the sea than the pupil who lives

inland and has perhaps never seen any body of water whose opposite shore was not clearly visible.

Finally, there are the two elements of vocabulary and fundamental reading habits. In the primary grades, failure to comprehend a story is usually due to a meagre vocabulary. Failure to understand a textbook in geography or any other field rests most often upon an inadequate special vocabulary. Thus, if a student reads in his history textbook that the "treaty included a clause providing reciprocity," he must know what is meant by "treaty," "clause," and "reciprocity." This problem of adequate meanings is always most acute during the initial stages in the acquisition of either general or technical vocabulary.

The child who comprehends well usually reads rapidly enough to be in the highest third of his grade in speed; that is, the relationship between speed and comprehension is direct. The slow reader gains no added comprehension through the greater amount of time spent in the reading process. Such statements sometimes lead a teacher to an erroneous conclusion. She may think that because the rapid reader reads well, she can transform a poor reader into a good one by pushing him through his reading matter fast enough. This will not work, because the pupil will not be reading rapidly, but hurriedly. Speed and hurry are not at all the same thing. Speed is the natural result of a smooth efficient integration of muscular movements. As soon as this integration is achieved, a pupil cannot help reading rapidly. Hurrying is the result achieved when a pupil makes inefficient movements more rapidly—and usually worse—than usual.

The rapid reader generally understands well because he sees the reading matter in large units, which

—in turn—make comprehension unusually high. Speed and comprehension are therefore directly related because both depend upon the use of a wide reading span. Neither causes the other. The rapid reader is not hurrying. He is reading at a natural, comfortable, and relaxed rate. He is under less pressure than the slow reader. The poor reader is much like the poor swimmer, who thrashes about, expending enormous amounts of energy and making thousands of separate muscular reactions but without progressing much through the water. The good reader, like the good swimmer, makes a small number of accurate and efficient movements, relaxes in comfort as he progresses, and achieves his goal with little effort. Speed and comprehension are therefore directly related because both depend upon a thoroughly integrated series of reactions. Comprehension and hurrying are inversely related because the pressure under which the child is reading breaks down his inefficient methods into even greater inadequacy.

The numerous factors that go to make up poor comprehension in a given instance are illustrated below.

The case of J is a good example of the lack of * proper early training and experience. When he entered school at the age of six he was unable to speak the English language. The following year he moved to New York City, where he attended five different schools. Returning to Chicago at the age of eight, he entered a south-side school where it was found that he could not read. He made very slow progress during that year, but was permitted to enter the IV-B class on trial the next autumn. Again he failed to make sat-

* Used by permission of the *Journal of Educational Research*.

isfactory progress, and he was sent to a private school to repeat the work of the fourth grade. At the age of ten he entered the V-B grade of the University Elementary School. The principal and teachers found that he was discouraged, timid, and obstinate. He failed to meet responsibilities. It required a long time for him to accomplish any assigned task. In spite of these handicaps he was promoted regularly to the VI-B and VII-B grades.

Prior to entering the seventh grade, he took little or no interest in the things that other boys of his age normally did. He cared little for sports and far less for reading. During that year, however, his interest was awakened along many lines and he began to read widely. His records showed that in the VII-B grade he read a total of one hundred and two books. At first he read books which are usually enjoyed by pupils in the lower grades. Later he began to read books somewhat more difficult and more suitable to his age. A majority of the books read were in the Boy Scout Series or related to sports, athletics, adventure, history, or the experiences of detectives. At the time this study was made he was most interested in detective stories. Questioning revealed the fact that he was woefully lacking in experience. Estimates made by his teachers showed that he ranked very low in intellectual interests and was unable to read effectively selections which went outside of a narrow range of topics.

The facts secured through this study show that J had received a poor start in reading, that he had made very slow progress during the first five grades, that since that time he had advanced rapidly in ability to read, but that he still ranked low at the time of this study. The progress which he made was accompanied by awakened interests which resulted in a large amount of reading. In the light of all the facts secured, the conclusion was reached that further progress de-

pended more largely on effective stimulation of interest in reading about an increasingly wide range of topics rather than on systematic drills in specific phases of reading. His work during the first half of the current year indicated that an accurate diagnosis had been made.⁶

It should be noted that the majority of the elements leading to this pupil's poor work are matters which are not under school control.

It may be seen from the description above that comprehension is the result of a complex functioning involving a number of different elements. It is related to all its components in greater or lesser measure, for any given selection of reading matter. If everything proceeds smoothly, the child comprehends. If there is a hitch anywhere, his understanding is not perfect.

MEASUREMENT OF COMPREHENSION

Comprehension is relatively difficult to measure. No method thus far devised is wholly satisfactory. The earliest technique was to have a child read a given selection and then explain orally what the story was about. This method is undesirable because it is inaccurate. The child's recitation depends upon his speaking vocabulary—which is undoubtedly smaller than his reading vocabulary—his degree of self-consciousness, and the assistance he gets from the amount of interest shown by his listeners. If a written report is substituted for the oral, the measure is even less accurate because such a report depends upon a child's ability to write, spell, punctuate, and express himself in writing. While he may have read a selection quite

adequately, his written report may reflect only a small per cent of what he has really understood.

It is always best, after a child has read a story, to ask him either oral or written questions about it. The oral questioning is generally undesirable, however, because the questions are rarely well formulated, because they vary from one child to the next, and because only one pupil can be tested at once. It is better to use a set of carefully prepared printed questions. If the answers to these questions are written, the same objections apply as to the written report just mentioned. If a child is presented not only with the questions but with several answers from which he is to select the best one, the resulting measurement is more accurate than that afforded by any other means thus far devised. It is necessary, however, that the questions and the various answers should not introduce any words which do not appear in the story, unless such words are extremely simple. Otherwise a pupil may be able to understand the story but not the questions about it.

Any test of comprehension is only a small sample of a child's total reading ability, because of the short period available for testing. For instance, if a test presents ten different paragraphs with questions about each, a pupil will need at least thirty minutes and probably more for completing his reading. Such a period is as long as elementary pupils can work efficiently. With older pupils a longer time can be used, but at best any testing period is lamentably short. The results are based upon a small and arbitrary sample of all the possible kinds of reading matter that a student might meet in the course of his daily work. The value of any reading test results de-

pend, therefore, upon the representative character of this all-too-meagre sample. If a test for third-grade children contains five paragraphs, all dealing with fairy stories, the results will not give an accurate reflection of ability, because fairy stories make up only a portion of the total reading material covered by third-grade children. If a reading test for high school seniors is made up exclusively of selections from classic English authors, the same objection applies, because the high school senior reads many other types of material. At any level in school it is necessary that the samples used in a particular test should be selected from as wide a range of reading matter as possible. The necessarily short sample bears, at best, none too high a relationship to comprehension as it functions day after day in the schoolroom.

The degree of comprehension cannot be measured in any direct way. Speed can be directly measured in terms of the number of words read per minute. Vocabulary can be estimated with fair accuracy from a small but properly selected sample. There is no such direct way of estimating comprehension. The best measure is obtained through use of a well-constructed standardized test of reading ability. The paragraphs or stories in the test should cover as wide a range of topics as possible. The questions used to measure comprehension of these stories should be objective and should not introduce any new terms. The test norms should not only be based on a large number of cases but should show a large interval between the medians for successive grades. A test whose norms for the fourth, fifth, and sixth grades are respectively thirty-one, thirty-four, and thirty-six questions right, is quite useless, because the intergrade intervals are so small

that pupils in all three grades will make scores overlapping on the scores of all other grades. If, on the other hand, these three successive medians are thirty-one, fifty-two, and seventy-eight, the overlapping will be considerably less and the meaning of scores increasingly greater.

The teacher should not expect to construct her own tests in this field. In speed and vocabulary she can formulate tests that are reasonably accurate. For the measurement of comprehension, however, she has to depend upon reading tests constructed by experts. If she tries to make such a test herself, she is almost certain to fall into one or more of the numerous pitfalls that await the inexperienced test constructor. If she is allowed to select her own reading tests, she should make use of the general principles indicated above so that of those available she will obtain the best possible test. It may be said in passing that the ideal test of reading comprehension has yet to be published.

CLASSROOM METHODS IN THE TEACHING OF COMPREHENSION

In all teaching which is devoted to the development of comprehension there is one basic principle. *Children will find meaning in what they read only if they are looking for it.* Conversely, the most common reason for failure to find meaning is the habit many children have of plodding along without expecting any. The teacher, through her type of assignment, inevitably develops or discourages this bad habit. For example, if a pupil is told to read the next five pages and is given no guidance whatever in what he may

find there, he usually just plods; his comprehension is more likely than not to be low. If he is told to read the next five pages and remember as much as he can of what he reads, his comprehension will be better. If he is told to read the next five pages and find out, for example, why most natural harbors have large cities on their banks, he will understand still more. If he is asked to read this selection and not only find the necessary explanation but also explain any exceptions, his comprehension will be improved even further. In other words, the more meaning the child is asked to get from a given assignment, the more he will obtain. Many children are looking for nothing—and they generally find it.

This basic principle of actively looking for meaning works out in different ways at different levels. When the first-grade teacher is presenting individual words she can emphasize their meaning quite as much as their appearance. She can, for instance, put on the board a number of verbs, such as: *jump, stand up, sit down, walk, lie down, turn around*, and so forth. The pupil called upon not only tells what the word is but acts out its meaning; in fact, he may do the latter without the former. In teaching nouns, the pupil may be asked to match the words with pictures of the object. Such a procedure stresses the meaning of the word as much as its form. Any simple relating of a story or any acting out of its events also stresses content. In the later grades the teacher can raise the level of comprehension if she never gives any assignment without providing clues as to what a pupil should find. Thus, for example, he may be asked to find the main ideas of a story or to note some particular type of detail. He may be given a set of questions to be

answered by his reading. He may be asked to draw inferences of various sorts, to find in his reading matter arguments for or against a given conclusion, to write out what he thinks are good test questions, or to make simple outlines of what he has read. All these techniques have for their purpose the emphasizing of meaning. If pupils are thus instructed in what to look for, the chances of their finding it are greatly increased.

On the ground that a pupil should dig out the facts for himself some teachers object to furnishing pupils with this kind of assistance. This process of digging out meaning for oneself without guidance is a characteristically adult performance. Elementary school children are certainly not mature enough for it. Any reading matter they meet in their daily work is almost certain to be too hard for them to understand without help. The most common form of assistance is to present a list of questions whose answers the pupils are supposed to find. When one looks at the carelessly worded and poorly selected questions often used, one is not surprised that teachers object to this form of guidance. If a child is given a half-dozen questions, each dealing with some trifling detail and each answerable by one or two words, he naturally gets the idea that reading consists of hunting around for minutiae that have no particular importance. The questions must be well selected and adequate. They need not be numerous and—while some of them will naturally involve consideration of details—they should necessitate a grasping of the main points in the assignment being read. If two or three properly formulated questions are provided, they will require comprehension of all the ideas in a selection before they are answered.

Anyone who disapproves of these aids to understanding should make sure that the fault does not lie with her own questions.

Finally, teachers should be sure to make some kind of a check upon any reading that is done. A child who has read a special book may tell the story to the rest of the class. Another pupil may build a model of some sort, illustrating what he has read. A third may prefer to write a summary, while a fourth turns in an outline. No formal test is necessary, but a teacher should always ask a pupil to give some evidence of comprehension, especially of the type of material generally classified as "outside reading." In the elementary school there is relatively little reading of this type, although even as low as the third grade some children do extra reading at home. As a child advances through school the amount of reading he does outside of the class increases. The comprehension of this reading will always be better if the pupil knows the teacher will make a check upon it. Some teachers are certain to object to this idea because they feel that a child should read for the love of reading and not because his comprehension will sooner or later be measured. The question is not one of morals nor of emotional attitude. It is rather a matter of reading aimlessly as compared to reading with a purpose. Books that are read without any definite purpose are soon forgotten. In fact, adults who read detective stories for relaxation often read the same story twice and do not recall, until they reach the last chapter, that they ever saw the book before! They do not remember because their first reading was done with no other purpose than diversion. Children also tend to read aimlessly—and they do not limit this technique to recreational

reading. When they are preparing an assignment, they should always have some purpose in view—and the more definite that aim, the better will be their comprehension.

The main suggestions for classroom teaching are, then, that the pupil should receive definite guidance in what meaning he is to look for and that he should always read for some purpose that is satisfactory to himself. If these procedures do not bring results, the teacher should use remedial measures, such as are to be described in the next chapter.

S U M M A R Y

Comprehension is a highly complex activity that has thus far resisted efforts to break it down into its elements. It depends upon many different things, most of which are outside the teacher's control. About all she can do is to direct what powers of comprehension a child has developed. To this end she should always give her assignments in such a way as to help the pupil get meaning from what he reads. For the measurement of comprehension, a teacher should use, for the most part, materials prepared by experts because the construction of an adequate test in this field is difficult. Even the best are none too good.

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XII

REMEDIAL WORK IN COMPREHENSION

UNLIKE the remedial work in either speed or vocabulary, the exercises to improve comprehension are not usually preceded by analysis. An analysis could be made to determine the reasons why a child did not understand a particular story, but the results would not be of much general value. One would find, for instance, that the story in question concerned material either unfamiliar or uninteresting to the pupil, and one would undoubtedly discover many words he did not know and would observe possible bad habits in his fundamental procedures. When the items dealing with reading habits and vocabulary were eliminated, however, there would be relatively little left that dealt exclusively with comprehension; what did remain would be vague and inapplicable to reading in general. Thus far comprehension has remained a synthetic process that no one has succeeded in breaking down into its elements. Until this can be done analysis is not likely to prove helpful.

The main precaution a teacher should take is the postponement of remedial work in comprehension until she has worked with defects of speed and vocabulary. This postponement does not by any means indicate that comprehension is less important. It is obviously more important than anything else. However, if the teacher begins her work with comprehension,

she will find many children whose low understanding is due to the peculiarities of eye movement, lack of phrase-reading, vocalization, or inadequate vocabulary. She will thus be forced into remedying these shortcomings before she can begin her work in comprehension. It is therefore better to include in the remedial group for training in comprehension only those pupils whose defects of speed and vocabulary have already been eliminated. For one thing, several pupils will no longer need drill because their defects—although reflected by a low level of understanding—really lay in other fields. Moreover, the teacher will have the previous work as a basis for the various types of drill recommended below. Comprehension is the most important phase of reading, but it is also the most complex. Remedial work in this phase should therefore be postponed to the end of the training period.

REMEDIAL DRILLS IN COMPREHENSION

Below will be described nine different types of exercise that have been found useful in raising the level of comprehension. Many duplicate forms of each exercise are needed in order to provide the necessary amount of training. A series is hardly worth using unless it contains at least forty exercises, because the pupils do not get enough drill with a smaller number; it is better if there are about sixty in each series. The easiest of the exercises should be at the grade level represented by the poorest readers in the class. For instance, a seventh-grade teacher may find her poorest students reading at about fourth-grade level. She should, then, begin the series with reading matter

taken from that grade. She will need relatively few of the easiest exercises, but increasingly more at each level as she approaches her own grade. Naturally a teacher cannot be constantly preparing such a large number of exercises for use by each class. She must therefore arrange her materials so that her exercises will not be marked and can be used by one class after another. The best way the writer has found for achieving this end is to run off about six copies of each exercise and mount three of them on cardboards, keeping the other three in reserve for replacement later on. The exercises are easier to administer if those from each grade level are mounted on a different color of cardboard. It is not in the least necessary to have more than three copies of any one exercise, and for a small class two copies are sufficient. For instance, if there are twenty pupils in a class and there are two copies each of ten different exercises at the fourth-grade level, each pupil can be using an exercise from this grade at the same time. The fact that they are not all reading the same exercise is of no importance.

After the exercises are prepared, the teacher needs to make an answer file. Since all exercises should be self-administering and self-scoring, the pupils must have access to the answers. It is easiest to write the answers to a single exercise upon a library card, keeping these cards in readiness in a file.

Both exercises and cards should be numbered to correspond. The following system of numbering has been found satisfactory. The series themselves are denoted by capital letters—A, B, C, D, . . . —for as many series as there may be. The designation for all exercises within a given series begins with the appropriate letter. The number of the grade level from

which the materials of an exercise were taken is shown by the first number after the letter. Thus all exercises in the second series on the fifth-grade level are numbered B5. The last number needed merely distinguishes the exercises of the same series and grade level from one another. Thus, B52 is the second fifth-grade exercise in the second series, while D79 is the ninth seventh-grade exercise in the fourth series. This system of numbering permits one to tell at a glance exactly what a given child is reading. The pupils need merely to know that each capital letter indicates a new series; within the series, they are to finish exercises beginning with 3 before those beginning with 4, and so on. The answer cards must also carry these numbers so that a pupil can tell what answer goes with what exercise.

Few teachers have any large file in which they can keep series of exercises, but they can easily make an adequate repository. All that is needed is a cardboard box, of the type on hand at any grocery store, wide enough to hold the exercise cards and long enough to contain at least one entire series. In the upper grades, where the children are old enough to refile cards accurately, several series may be kept available in such a box.

The administration of each series is essentially the same. On the day a series is begun each pupil gets some exercise from the lowest level and reads it. He answers the questions or follows any other directions. The exercises usually call for writing the answers upon a separate piece of paper. He then goes to the answer file and compares what he has written with the answers there and scores his own responses. Then he returns the score card to the file and his exercise to the place he got it from, takes another from the

same grade level, reads it, writes out his answers, and compares them with the appropriate card in the answer file. Again he returns his materials to the places where they are kept. This procedure continues until he has either finished all the exercises at that level or has completed three in which he has made no error. When this time comes, he tells his teacher that he has finished the work at that level. She has a private file of exercises which she uses for tests. She now takes out a test which is similar to the exercises just completed except that there are no answers for it in the file. When the pupil is through with it, he hands his test and the answers to her. If they are satisfactory, he goes on to exercises from the next level of difficulty. If not, he takes more exercises of the previous level, providing he has not already read all of them. If he has read all of them, the teacher may use her judgment as to whether or not he should reread some of them before going on to the work of the next grade.

The children progress, of course, at different rates. It is best, however, to complete one series for the entire group before allowing any children to go on to the next series. If exercises of more than one type are in use at once, they are almost certain to get confused and be put back in the wrong place. Pupils who finish a series earlier than others may be allowed free time for reading until the others are done. Each child should continue taking exercises of a given type until he has reached his own grade level or has gone as far as he can. When all have finished work on the first series, the cards containing these exercises should be put away and those for the second brought out. This general procedure is the same for all series. For older

pupils, if desired, more than one set may be available at a time.

It should be noted that this method permits each child to work at his own rate without disturbing others, does not necessitate the marking of the exercises in any way, and at the same time permits the teacher to check on each child's progress at stated intervals. Some children will cheat at first by altering their answers or copying them directly from the answer card, but they do not give themselves any adequate training and consequently do not pass their tests. Two or three such experiences are sufficient to convince them that they are cheating no one but themselves and that their dishonesty is preventing rather than aiding progress. An incidental advantage of this type of training is its capacity for developing dependability, self-guidance, and resourcefulness. Perhaps the child who profits to the largest extent by these exercises is the immature pupil whose comprehension is low, not because he does not know what to look for, but because he does not have sufficient independence to look for it by himself.

The exercises in the series below are arranged in an approximate order of difficulty rather than importance. The three most important are the first, fifth, and eighth. A teacher is advised to prepare the first and fifth before any of the others.

1. *Getting the Main Idea from a Paragraph*: An exercise of this type consists of a single typewritten page containing four or five short paragraphs taken from different sources. A sample exercise appears below.

DIRECTIONS: Read each paragraph. Then, on a separate sheet of paper, write ONE SENTENCE for each

paragraph, telling what the main idea is. Do not write more than one sentence for a paragraph. Do not copy any sentence out of the stories; make up your own.

1. Devil's Island, the most famous French prison, lies about ten miles off the coast of South America. The island is a solid rock of 34 acres. There is nothing on it except some palms and a dozen small stone cottages. Prisoners are sent there for life, and today it holds only six. They are men who have committed treason or some other crime against France. Captain Dreyfus was on Devil's Island. Each of these six men has a cottage to himself. He is locked in it from six at night until six in the morning. During the day he may do whatever he likes. He has no duties, except that he must care for his own cabin and cook his own food. No one has ever escaped from Devil's Island. The currents around it are so fierce that even a steamer has difficulty in approaching. Then there are thousands of sharks. A French government boat brings food; no other boat ever goes near the place.*

2. The worker bees in a hive regard the queen as sacred. The purest honey is reserved for her use alone. Some of the bees watch over her by day and by night. If she has the least accident the news will spread quickly from group to group, and the whole population will rush wildly to and fro. If she is taken away from the hive too early, all work will cease. The young will no longer be cared for, the workers will cease to visit the flowers, the guards at the entrance will leave their posts. Little by little the amount of honey in the hive will become less. The older bees will die and the unborn eggs will never develop because they were not fed. Finally, every bee in the hive will die, even though every flower of summer bursts into bloom be-

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fore them. But if the queen is restored before the bees have grown too hungry and tired they will receive her with extraordinary, pathetic welcome. They will flock eagerly round her, present her with honey, and escort her back to the royal chamber. Order is at once restored, work resumed, and the hive soon resounds with the gentle buzzing that never is heard unless the queen is alive and well.*

3. Newspapers have for years taken up great amounts of space in every library. Usually they are kept in the basement in large rooms, which—in spite of their size—get more and more crowded every month. Some libraries are beginning to photograph newspapers on ordinary motion picture film, one page to each film. When some one wants to read a copy of a paper, he puts the roll of film in a reading machine. The films are shown on a flat surface. This surface can be made large or small according to the reader's desires. Pages are turned by advancing the film one frame. Under usual conditions, a volume of a daily newspaper for one month contains 3500 pages, occupies 2056 cubic inches of storage space, and weighs 60 pounds. Reduced to film, the same month would require a roll that fitted into a box 6 inches long, 3 inches high, and 2 inches thick. The box and film together would weigh $1\frac{1}{2}$ pounds.†

4. The first thing that one notices in Switzerland is a high, wild, and very beautiful mountain range. Its lower slopes are covered with vineyards, orchards, wheat fields, and meadows, with pleasant villages in every valley. Higher up we see green forests of oak and walnut, then tall dark pines and firs. After this we find low shrubs full of bright flowers, and green pastures

* Used by permission of the *Readers' Digest*.

† Used by permission of the *Fact Digest*.

with herds of cows and goats, feeding upon them. Higher still are the tall, sharp peaks covered with ice and snow, and glittering in the sunshine like diamonds. Bright streams flow through the pleasant green valleys, leaping over steep rocks in waterfalls, some of which are so high that the water in falling changes into spray or mist. Sometimes the streams go leaping and dancing into hollows among the mountains and make beautiful lakes that smile in the sunshine and reflect the snowy peaks above them, or the green forest around them.*

In selecting paragraphs one should be sure, first, that each paragraph has a main idea and, second, that this main thought is not expressed in any single sentence.

When a child has read an exercise, he takes a separate sheet of paper, puts his name and the number of the exercise at the top, and writes a *single sentence* expressing what he thinks is the main idea in each of the paragraphs. He should be warned that he will have to construct a sentence of his own and that sentences copied from the paragraphs will not be accepted. The wording of his sentence will not be exactly that of the sentence the teacher has written on the answer card, but it should contain the same central thought.

2. *Getting All the Ideas from a Paragraph*: This exercise is included in the series primarily to offset a certain undesirable influence from the previous set, as well as to train children in accurate reading for details. A few children conclude from the exercises in finding the main idea that anything else is unnecessary. Therefore they become neglectful of details. A

* Quoted from the *Brooks Readers*, by permission of the American Book Company.

sample of this second type of exercise is presented below.

DIRECTIONS: Read each paragraph and then write out the answer to each question. Use a separate sheet of paper for writing your answers.

1. Just before dawn the man came to the bank of the river. Here he pulled his horse up sharply and stared around him. This was the last camping place of those two companies which had led the way—the last they would ever know. Before him were the burned remains of their wagons and here and there lay a silent figure. He rode closer. At the side of one wagon lay the body of a woman, her arms clutching a baby. Both of them were dead. A little beyond her he saw the figures of three men. Several dead oxen and mules lay in the center of the camp. No place was there any living thing. For several minutes the man stared at the scene before him. The attack had probably come just at dawn and had taken them by surprise. He pictured what had happened; the wild yells of the Indians, the whistling of arrows, the flashing of knives, the rattle of gunfire, the terror of the defenders, and then the battle which had followed, the killing of the wounded. An attack just like this one would probably come the next morning to his own party. All that they could do now was get ready to fight. At least he could carry them warning of what they could expect.*

1. At what time of day did the man come to the camp?
2. What did he find there?
3. Was anything burned?
4. What did the woman have in her arms?
5. Was anyone or anything alive?
6. Who had attacked the wagons?

* Quoted from *All-American Stories*, by permission of the Frank A. Munsey Company.

7. What weapons were probably used?
 8. What did the man do?
-

2. Building a house in those days was hard work, but all the people got together and had such a good time that they didn't notice how hard it was. First they laid some big logs out in the shape our house was to be and then they piled more logs on until the walls were about seven feet high. When the walls were built high enough and the openings for the door and two windows had been made, the neighbors started on the roof. Wood was pretty scarce but we had bought enough three-inch poles to make the roof. Over these was laid a thick layer of grass and then a layer of sod—that is, earth with the grass growing on it. To top it off, the roof was covered with another layer of marsh grass which stuck out over the walls. This was to protect the walls from rain. We were proud of that roof, even though sometimes it did leak. The final touch that made our house the best in the neighborhood was the windows that we had carefully brought out with us from the East. They had real glass in them. We were the only people for miles around who had real windows. We kept the walls nicely painted on the inside, and after we had walked around on the dirt floor for a while it got hard as a rock. We were really very comfortable in our little house.*

1. Did each person build his own house?
2. How high were the walls?
3. How many windows were there?
4. Was the house made of wood?
5. What was used to make the roof?
6. Did this roof ever leak?

* Quoted from *Wee Wisdom*, by permission of the Unity School of Christianity.

7. What made this house different from others near by?
 8. What kind of floor did the house have?
-

3. My father arranged with some men to take our cart and the oxen across the river on a raft. The men then went back to their raft. First, they lowered a flat piece of board that was joined on the raft on one end while the other end rested on the shore. This piece was called an "apron." This apron reached from the boat to the dry dirt in the trail. The oxen now had something safe and hard to walk on as they were driven onto the boat. When the oxen were in place and the wheels of the wagon were chained so they could not roll, the apron was raised and fastened to the side of the raft. The anchor rope was untied. We were ready to cross.

Each of the boatmen picked up the long pole from the side of the boat and pushed it into the soft bed of the river. They stood at the back of the wagon and pushed on the poles with all their strength. Thus the boat was slowly moved away from the bank and out into the middle of the river. The river was shallow here, not more than four or five feet deep, but it was wide. Again and again the men raised their poles. Again and again they pushed. Slowly they guided the boat with the wagon and oxen. When they reached the opposite shore, the apron at that end of the boat was lowered and the oxen pulled the wagon off the boat, up the bank, and out onto the trail.*

1. On what was the wagon carried across the river?
2. What is an "apron"?
3. Why was the apron used?
4. What was done to keep the wagon from rolling off the raft?

* Quoted from *All-American Stories*, by permission of the Frank A. Munsey Company.

5. Did the men row across the river?
 6. How deep was the river?
 7. What happened when they reached the opposite bank?
 8. Why was it necessary to use a raft?
-

It is usually best to have not more than three paragraphs on a page and it is probably better to have two of slightly greater length than those above. Each paragraph should be followed by a series of questions—objective or otherwise—covering the details. The teacher should use enough questions to cover all points in the paragraph.

When the pupil is ready to read one of these exercises, he should take a separate sheet of paper, put his name and the number of the exercise at the top, and then write the answer to each question, or select the right answer, in case an objective form has been used. These answers he then compares with the appropriate score sheet.

3. *Finding the Answer to a Question or Questions*: A single exercise of this type may consist of a series of short paragraphs, about each of which a question is asked, or of two longer paragraphs, about each of which there are two or three questions. It will be noticed that the question *precedes the paragraph*, so that the pupil knows before he starts to read what it is that he is looking for. A sample exercise of this type appears below.

QUESTION: What are the possible uses of a telephone from one part of a building to another?

1. There are hundreds of possible uses for a telephone from one part of a house to another. One sta-

tion may be placed at the bedside of a sick person and the other station in the kitchen, so the sick person may call downstairs easily. If you are annoyed by salesmen at the door, you can put one station of your telephone outside the front door and the other in the house. In this way you may talk with each caller without walking through the house. And you can refuse to let anyone in if you do not wish to see him. If you want to, you can put the telephone between your husband's workshop and kitchen. This arrangement makes it easy to call your husband into the house for dinner or for any other purpose, without going outside. You can change this telephone into a sort of loud speaker. The speaking end is put, for instance, in the nursery, where it will pick up any unusual noises made by the baby and will carry them to the kitchen or any other room where the mother is working. Doctors find such telephones very useful between their offices and their reception rooms. A businessman may use such a telephone between his desk and that of his secretary. In a restaurant one can link together the dining room and kitchen. In fact, any two rooms can be joined together in this way.*

QUESTION: Why are the men from the United States government so successful?

2. When men from the United States government go into the field to investigate a crime, they are not merely men who hope to keep their jobs by getting along as best they can. They take their places as volunteers in a small army of trained people who have an ideal of service—they believe that no man lives in the world of crime who can defeat them. They work upon the theory that a mere arrest means nothing but that only conviction counts. To that end they weigh carefully every bit of evidence which comes before

* Adapted, by permission, from material in *Science and Mechanics*.

them. They ask themselves whether this evidence points to the innocence of a man or whether it points to his guilt. They are self-appointed jurors, seeking for the benefit of the doubt as well as for the benefit of suspicion. The result is that when these young men bring a criminal into court and charge him with the commission of a crime, they have assembled their evidence; they have convinced themselves; they have so thoroughly done an honest job that less than one person out of every twenty-five escapes the testimony which they give from the witness stand.*

QUESTION: What do the children do on the first day of school in different countries?

3. When the Arab child first begins his school days he is dressed in rich garments, and he carries his book in a velvet bag. He rides a pony or a white donkey, and is met at the door of his home by the teacher and the pupils of the school. The teacher, in flowing robes and a green turban, heads the procession, and the boys and girls sing Arabic hymns as they march along. The new pupil often brings gifts, not only for his teacher but for all his schoolmates. The boy of Japan on his first day at school wears gay robes and carries a fan and a large paper parasol. In a bright-colored bag hung on his arm is a jar of rice for his luncheon. When he bids his teacher "Good morning," he kneels and bows his head to the ground to show his respect. The Chinese boy must bring his own stool and table when he first enters school. He must also furnish everything that he needs for learning to write. He is taught to make his own ink by rubbing a block of India ink on a wet stone. Then with a brush he learns to write the thousands of strange characters in his language. The boys of India find

* Quoted by permission from *Science and Mechanics*.

their schoolmaster seated on the ground under a tree, or in a large open porch upon a raised platform. The children sit or kneel on the floor, or on the ground, and sway their bodies back and forth as they study their lessons aloud. They learn to write by making their letters in the sand with a stick or with their fingers. After a time they copy letters and words with wooden pens on the leaves of the palm tree. They sometimes make curious books by tying together long narrow strips of palm leaves.*

In deciding upon the question to be asked, the teacher should be careful not to base it on insignificant details, but rather upon a general comprehension of the entire paragraph. It should, in so far as it deals with details at all, require the grasping of several points appearing in different parts of the selection.

When the pupil reads this exercise, he looks at the question first and then reads the paragraph, studying it to obtain an appropriate answer. He writes his answer on a separate sheet of paper, headed with his name and the number of the exercise. He is allowed only one sentence for his answer. Since he constructs his own sentence it will not agree verbatim with that found on the answer card, but his answer should contain the same facts, even though they appear in a different order. If he has omitted any part of the answer or if he has added irrelevant material, his sentence is not correct.

4. *Supplying Titles*: An exercise of this type consists of a single sheet containing four or five paragraphs, preferably of an expository character. As in the case of the first exercise described, the object of

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this drill is to isolate the main idea from its contributory elements. A sample appears below:

DIRECTIONS: Read each paragraph. Then write a title for each.

1. The most unusual discovery in the big cave was a stone box which we found standing in the middle of the inner room. Inside the box was a throne, carved from a single big piece of stone. It was carved in the shape of a jaguar and painted a vivid red. A jaguar is a very large kind of cat, smaller than a tiger; it has spots instead of stripes. Although the figure was hundreds of years old, it had been so carefully guarded in its stone box that the color was practically as bright as the day it was painted. Whoever made the jaguar had used bright green stones for the spots. The eyes were also made of green stones. The teeth were of hard rock. The length of the throne was $2\frac{3}{4}$ feet, its width through the shoulders 1 foot, and its height $2\frac{1}{4}$ feet. The seat of the throne was made from a single flat piece of stone having many different colors in it. The throne was beautiful, but the jaguar looked so fierce he made you feel almost afraid, even while you were admiring his beauty.*

2. It was the first night out. The last town lay eighteen miles behind them. Some two thousand miles away, to the north and west, lay Oregon. Theirs was one of the first wagon trains to get away that spring. Their leader had promised them that they would be the first to arrive in Oregon. Already that thought had stirred their imaginations and, after the wagons had been pulled into a circle and camp had been made and the evening meal prepared and served, there was much singing and laughter. Most of the members of

* Adapted, by permission, from *Science and Mechanics*.

the company had gathered around the campfire within the circle of wagons, but two men watched from a distance. They were a part of the group, yet not a part of it, for they had been engaged to guide the wagon train across the plains and mountains to the shores of the western sea.*

3. Scarcely had the three gentlemen turned the corner before Betsy was locking the little shop door and was on her way to the house of Mr. Morris, where she was told she would find an old ship's flag which she could use as a pattern. Hurrying next to a near-by store she bought some red, white, and blue cloth, and very soon Betsy was back home again hard at work upon the first flag. All afternoon she sewed, and as evening settled over the city she lit two tall candles and set them on her sitting-room table. By this light she sewed far into the night, her fingers flying fast. On the following day she notified Colonel Ross and Robert Morris to call to see the first sample of our flag. The two men were very pleased when they saw what Betsy Ross had done. They said they felt sure that General Washington would like the arrangement of the thirteen red and white stripes and the circle of stars in the square blue field. They agreed to show it to the General and obtain his opinion at once. Betsy had to wait only a day or so to learn that the flag had been approved by George Washington. Soon Betsy Ross had more orders for her new flag than she could fill.†

4. Slowly the balloon rose from the ground. In it was a young man who was to jump from the balloon as soon as it was high enough in the air. Below there

* Quoted from *All-American Stories*, by permission of the Frank A. Munsey Company.

† Quoted from *Wee Wisdom*, by permission of the Unity School of Christianity.

were about five thousand people watching him. Something seemed to be wrong. The balloon was wet and would not rise as high as the young man had thought it would. It sailed just above the tree tops. He did not dare to jump. Then he heard the gas leaking through a hole in the balloon. Slowly the big bag sank toward the ground. Right below it were some electric wires. The man could do nothing to steer his balloon because it had so little gas left in it. Nearer and nearer the wires it came. Down below, the people were all silent. They thought he would be killed. At the very last minute a breath of wind blew the balloon just beyond the wires. As it dropped gently to the ground, the crowd cheered. In another minute a white-faced young man stepped out upon the ground.

A child reads each paragraph and, on a sheet containing his name and the number of the exercise, writes down the title he would give each paragraph. More than one title is sometimes possible. If a pupil has a title unlike that on the score card, he should show it to his teacher. If it is an acceptable title, she should add it to the score card as a possible answer.

5. *Drawing Inferences*: This type of exercise is relatively hard to construct. A teacher will find few paragraphs that she can take word-for-word from books, although she will obtain many suggestions from readers and texts. Various types of paragraphs demanding inferences appear below.

DIRECTIONS: Read each paragraph or story and then answer the question about it.

1. What I noticed particularly during the next few days was the change that had taken place in this

quiet town. People that had been friendly now seemed to be bitter enemies. Many of the men in the village had been arrested or were missing. Their property had been taken and their families were wandering homeless, with former friends afraid to offer them food or shelter. The hopes of others had been swept away. Toni had to give up his store because it was ruined. Some of the youngsters who were at the big dance last year were starving. Maria, the postman's daughter, would not get married in the spring because Jaime was a prisoner and would soon be shot. Imprisoned with him were 38 other men from this town, all in danger of their lives.*

What do you think was going on that had changed matters in this town?

2. A sort of fear came upon the big man then. He didn't like handling that body. It was bloody. He could see that, even in the dark. He pulled once at the knife, but it wouldn't come away, so he left it there. He wiped the handle with a rag from his shirt. Then he undid the belt around the other man's waist. In the belt he found the little pocket for the pearls. He opened the pocket. It was loaded with pearls. A hundred of them at least. And some were huge. He closed the pouch and tucked it into a little bag that he wore around his neck. There were some things he had to do now—important things upon which his own life would depend. He filled a jug with water, stowed it in the rowboat on the deck of the boat. With it he put some bread. He had to work fast. A sea anchor came next. Matches? Yes, he had some in his pocket. He was all ready. He worked the ropes until he swung the rowboat out over the water. Then he got into it and low-

* Adapted, by permission, from the *Readers' Digest*.

ered it carefully into the sea. In a minute or two he was rowing away from the ship.*

What do you think this man had done, and why?

3. There once lived a young man by the name of Narcissus. In all the land there was no boy so beautiful as he. His eyes were as blue as the sea, and his hair was a golden yellow. But Narcissus loved only himself. He had no wish to share in the labors or sorrows of his fellow men. He wandered far away, and in the deep shadows of the forest he found a spring. Its waters were clear and still. Leaning down to drink of the pure water he saw his image reflected in its surface. Startled at the sight he looked again, and again the beautiful face smiled back at him. In sunlight and in moonlight he remained by the spring, seeing nothing but his own image in the water. As day after day passed by he grew more slender and pale. At last the gods, looking down upon his useless life, changed him to a flower. The blossom was as white as the pale cheek of the boy and as yellow as his flowing hair. And in memory of his beauty, the flower is still called Narcissus.†

How would you describe Narcissus?

4. Around and around a circle, five miles across, went the big man, riding his motorcycle. Behind him rose a cloud of fine dust, and the hot sun beat down upon him. Hours went by. The 100 degree heat of noon gave way to the cool of sunset, and the cold of midnight. Still the big figure and the motorcycle continued its flight around and around the big circle. Watching his progress were other men. Some of them had stop

* Quoted from *All-American Stories*, by permission of the Frank A. Munsey Company.

† Adapted from the *Brooks Readers*, by permission of the American Book Company.

watches; others wrote down numbers on a large black-board and held it where the rider could see it as he flew past; others stood ready beside gasoline pumps and rows of tools, ready on instant notice to do those things that sometimes have to be done to machines under constant and heavy strain. Every few feet along the course, there were fires that sent red flames and black smoke into the still, cold night. The flames paled as the sun rose. And still the motorcycle and its rider went on. There were moments when those with the stop watches checked their figures and let out excited yells. The day dragged on toward noon. The eager watchers became tired. But the rider seemed not to feel any tiredness at all. Noon passed again, and one o'clock, and two. Heat again lay over the course. When the watches showed 2:30, a flag was waved and the rider finally stopped. He turned off his engine, leaned his motorcycle against a wall, took off his glasses, and smiled at the other men, who cheered and cheered.*

What do you think this man had done?

5. Long ago, stories were told instead of being written, for in those days there were no books. The best of these stories have been retold again and again, and are now printed in books where all may read them. There is an old fairy story of a little maid who was so gentle and kind that roses and diamonds fell from her lips whenever she spoke. This was only another way of saying that kind words are as beautiful and give as much pleasure as flowers and precious stones. You have all read how the slow-moving turtle won a race with the rabbit who could run many times as fast. This fable has led many a child who learns slowly to work hard and reach the first place in his class. The story of Prince Charming and his wonderful ring that

* Adapted, by permission, from *Science and Mechanics*.

pricked his finger when he did something wrong is one of the very best of the fairy tales. These old stories never lose their charm.*

Why do you think these stories have been told and retold hundreds of times and are still popular?

In writing or selecting paragraphs for this series one should make sure that the word or the words to be used for an answer do not appear anywhere in the paragraph; that is, the answer must be an inference and not a mere copying of some significant phrase.

As before, the pupil writes his own answers on a separate sheet and compares them with the score card.

6. *Following Directions*: These exercises are really preparatory to the type of reading necessary in any laboratory course. In the elementary grades such a large portion of directions are given orally that pupils obtain relatively little practice in following written instructions. In fact, many adults never learn to do so. When junior high school pupils first start even the most elementary experiments in science, many are unable to read the directions. It seems, therefore, desirable to include such a set of exercises in this series. A sample exercise appears below.

1. Write down George Washington's name. Cross out the first two letters of the first name. Change the third letter from the end of the last name to an "s". Put a "d" between the "o" and "r" of the first name. Change the second letter of the last name to an "i". Write another "o" in front of the one at the beginning of the first name. Cross out the three letters after the "h" of the last name. Change the last two letters

* Adapted from the *Brooks Readers*, by permission of the American Book Company.


of the first name to "ow". Change the "h" of the last name to an "l". Cross out the first "s" in the last name. Begin the first name with a capital "W". Whose name is it?

2. Draw a straight line two inches long. Make a large dot at each end and another in the exact middle. Number these dots 1, 2, and 3, from left to right. Now draw another line of the same length, a half inch below the other and parallel to it. In the middle of this second line, put a dot. Number it with a 4. Now draw lines between dots 1 and 4, dots 2 and 4, and dots 3 and 4. Draw two more lines, both from dot 4—one to a point halfway between dots 1 and 2 and the other to a point halfway between dots 2 and 3. Finally, draw a line from dot 1 to the left end of the second line, the one on which dot 4 appears, and another line from dot 3 to the right end of the same line. Compare your figure with the score card.

3. Draw a square an inch long on each side. Put a number 1 in red pencil on the upper left corner, put a figure 2 in blue on the upper right corner; put a 3 in green on the lower right corner; put a 4 in brown on the lower left corner. Now draw two lines, one between dots 2 and 4, the other between dots 1 and 3. Where these lines cross put a number 5 in yellow. Color brown the triangle whose corners are 1, 5, and 4; color red the triangle whose corners are 2, 5, 1; color blue triangle 4, 5, 3; color green, triangle 2, 5, 3. Compare your results with the score card.

4. Draw, in one row, four squares, a $\frac{1}{2}$ inch long on each side. In the first square at the left draw a line from the upper left corner to the lower right corner. In the second square draw a line from the middle of one side to the middle of the other. In the third square draw two lines—one from the upper left corner to the lower right and one from the upper right to the lower left. In the last square, draw a line from the middle

of the top to the middle of the bottom. Now take your eraser. In the first square, erase the top and bottom lines. In the second, erase the right side. In the third, erase all four sides. In the fourth, erase both sides and the bottom. What word do you have left?

5. The best padlock is no better protection than the cheapest one if it is screwed onto a door in such a way that the screws can be removed with a screwdriver. If you want to make sure that no one will get into your garage, for instance, you should do something more than just screw on a padlock. Probably you know of people whose cars have been stolen by someone who simply unscrewed the padlock, without bothering to unlock the door. There is a solution to the problem. It is only necessary to cut away the screw head on opposite sides of the long, narrow groove into which the screwdriver fits. The top of the screw head looks like this . What you do is to file down one side of the groove from the outside edge of the screw head to the middle, and then file down the other side from the middle to the opposite edge. When the screw heads are all fixed in this way no one can take the screws out. Copy the above drawing of the screw head and show where you would file it along the groove, in order to follow the directions given above.*

It will be noted that the pupil has to do something in order to indicate his understanding of the directions. He may carry out his instructions by drawing, by coloring a picture, or by writing answers. In any case, the scoring is simple because the instructions are definite and the pupil has either followed them or has not followed them. In the construction of exercises of this type the teacher will not find many paragraphs that she can use as they stand. Any laboratory manual

* Adapted, by permission, from *Science and Mechanics*.

gives directions, but since the necessary apparatus is lacking in the ordinary schoolroom it is necessary for her to write most of her own directions. Because of the lack of available material this series is undoubtedly the hardest to construct.

7. *Finding Arguments for or against a Given Conclusion*: This type of exercise cannot be used much in the elementary grades because the mental operations are too difficult; moreover, it is almost impossible to find, at these levels, materials that contain facts open to argument. The series should therefore begin with selections taken from junior high school books. In many instances, the teacher will find it necessary to rewrite paragraphs introducing more points than were originally present. A single longish paragraph is sufficient for one exercise. An exercise of the recommended type appears below.

DIRECTIONS: Read the story below. Then consider the statement that appears just before the story. At the end of the story you will find two lists of arguments. In the first you are to find which arguments prove the statement to be right; in the other list you are to find which arguments prove the statement to be wrong. Do not mark the exercise. Copy on a separate sheet the numbers of the arguments you select.

Statement: That an Indian baby was healthier than a baby of today.

An Indian baby was not born in a warm hospital. His mother had no nurse or doctor. However, she often did not need such help because she was strong and healthy and accustomed to hardship. Her baby usually inherited the good health of his parents. If he were not normal and strong at birth he did not live long,

because he could not be given the care that a sick baby receives today.

An Indian mother made a cradle out of a flat piece of wood and some hide. She covered the wood with soft fresh grass. Then she put the baby on the wood, put a large piece of hide over him, and tied him on to his cradle with strips of hide. She carried this cradle on her back as she walked from place to place. This bare board, even when made softer by grass, was not nearly so warm as the modern cradle. Air blew in around the edges of the fur blanket. In this kind of a cradle the Indian baby was carried about, in rain or snow as well as on sunny days. He was often wet and cold. To be sure, his mother—who loved him as much as modern mothers love their children—tried to keep him warm, but she often could not do so. When she and her family were following wild animals about to get the food they needed, the baby had to go along, too. If the weather was bad, he had to stand it as best he could. He was not kept inside a house on rainy days or driven about in a car as children are today.

On the other hand, he got plenty of sunshine and fresh air. He did not need cod-liver oil, because he was in the sun so much of the time. He did not have many colds, because he became strong and hardened by constant exposure. He was less susceptible to disease than modern children, who live in steam-heated houses. Moreover, children in a city are constantly coming in close touch with diseased people on streetcars, in theaters, or even in schools.

The modern cradle is warm and soft. It protects the baby in it from cold. The Indian baby's hard cradle kept his back straight, because he was strapped onto it. The board may not have been very comfortable, but it did keep the baby from developing a crooked spine.

The proportion of babies who lived to grow up

is much higher now than it ever was among the Indians. Babies who were the least bit weak could not stand the hard life and constant exposure. They soon sickened and died. Nowadays a weak baby has a much better chance to live. He can be given expert care and attention. Sometimes in hospitals a baby is put into a warm incubator and fed only clean milk from a clean bottle. This treatment often saves the lives of babies who would certainly have died without it.

When an Indian baby got sick, some of the old men and women of the tribe gathered around him. They sang special songs and danced and beat drums. They believed that a wicked spirit had entered the baby's body and made him sick, so they tried to drive the spirit away with a lot of noise. If the baby had enough natural vitality he lived through whatever disease he had; if not, he died. There was no doctor.

You can see that in some ways the Indian baby lived a healthy life. In other ways, the modern child has the advantage. There are arguments on both sides of the situation.

IN FAVOR OF THE ARGUMENT

1. An Indian baby never cried.
2. An Indian baby was hardened by exposure.
3. An Indian baby didn't live long.
4. An Indian baby wasn't loved by his parents.
5. An Indian baby developed a straight back.

AGAINST THE ARGUMENT

1. An Indian baby received no medical care.
2. An Indian baby had a hard cradle.
3. An Indian baby was strong at birth.
4. An Indian baby was happy out of doors.
5. An Indian baby was hardened by exposure.

- | | |
|---|--|
| 6. An Indian baby usually inherited good health. | 6. An Indian baby was often wet and cold. |
| 7. An Indian baby was not born in a hospital. | 7. An Indian baby did not need cod-liver oil. |
| 8. An Indian baby got plenty of sunshine. | 8. An Indian baby was never sick. |
| 9. An Indian baby was not exposed to many diseases. | 9. An Indian baby often died because he couldn't be cared for. |
| 10. An Indian baby was always well. | 10. An Indian baby developed a crooked spine. |
-

The subject of the argument appears before the paragraph, then comes the reading material, and finally two lists of arguments. It will be noted that in the above sample the arguments for and against have been listed objectively. Some arguments appear on both sides. This arrangement is made purposely to see if the pupil can tell which side an argument is supporting. There are, of course, the correct arguments—sometimes listed on both sides—and a number of quite irrelevant points. At least the first few exercises in the series should use this objective form. In high school there is no reason why, later on in the series, the arguments cannot be listed by the students themselves.

When the student takes an exercise of this type, he reads the argument, then the paragraphs, and then studies the two lists presented. He takes a separate sheet, writes his name and the number of the exercise

at the top, and then lists by number and letter the arguments belonging on each side. This record he then compares with the score sheet. If the objective form is not used, the pupil writes out two sets of facts. One list contains the facts supporting the argument; the other contains the facts against it. This form of exercise is, of course, more difficult to score. An exercise is correct if the pupil has listed on each side of the argument all the facts that belong there, regardless of the order in which he has stated them. Omission of necessary facts or addition of irrelevant points both make an exercise incorrect.

8. *Simple Outlining*: Exercises of this type should be at least two pages long, since it is difficult to outline—without getting down to the very last detail—an excerpt so short as a single page.² One should select for this purpose only expository material, because a narrative has essentially no outline. For ordinary purposes the outline should not require more than three degrees of subordination, and at first not more than two. A sample exercise from such a series appears below.

DIRECTIONS: Read the selection below and then make an outline. At the end of the second page you will find the headings for your outline. These headings will tell you how many main ideas and details you are supposed to find in the selection. Do not use any more spaces than appear there, and be sure to fill in all of them.

Any community should be careful about its water supply. In every state and large city there are men called "sanitary engineers," whose main business is to keep drinking water from becoming contaminated. It is only in recent times that people have learned how

to keep drinking water clean. Now that the methods are known, no community should allow its water supply to become dirty. Pure water is vital to everyone.

There are three main reasons why water should be kept pure. The first, and most important of these, is the prevention of disease. In earlier times there were terrible epidemics in which as many as half the people in a city died. Probably the most common disease in these epidemics was typhoid fever, which is almost always spread by germs in water or milk. Some people carry germs of the disease about with them, although they themselves are not sick. Other people have a relatively light case of typhoid fever and manage to carry on their usual work, in spite of feeling ill. In earlier times there was no adequate drainage system. The toilets were out of doors, and the contents in the toilets drained directly into the soil. Whenever a typhoid "carrier" or a person who was sick with the disease used the toilet, he contaminated the soil in the immediate neighborhood. The germs from the disease are not killed by contact with the ground. They drained through the soil and by gradual stages worked down from the hillsides into the river or pond in the nearest valley. People who drank the water then became sick also. Even with modern systems of drainage, it is almost impossible to prevent occasional contamination of the water supply. Whenever germs of any disease get into the drinking water there is sure to be an epidemic, unless the water is purified in some way. The first reason, then, for having clean drinking water is the prevention of disease.

Although the main objective of the sanitary engineer is the control of epidemics, it is worth while to sterilize water because it tastes better. Any filter removes from the water all foreign substances, such as weeds or mud, while a chemical treatment often removes metallic substances that give water a poor taste.

Pure drinking water does not have the disagreeable taste often characteristic of water that is dirty.

Another reason for sterilizing water is the resulting increase in its use, with an accompanying decrease in the use of alcoholic drinks. In many places people drink wine and beer with all their meals, because it is not possible to find water that is safe to drink. Although the amount of alcohol taken at any one time is small, the constant use of either wine or beer leads to many diseased conditions. In Vienna, for instance, until recent years it was not safe to drink water. In fact, no waiter in a hotel would bring a customer ordinary water. All that one could get was bottled spring water, which was usually more expensive than all the rest of the meal put together. As a result of this condition, the people of Vienna consumed enormous amounts of mild alcoholic drinks. With the establishment of a pure water supply, the consumption of alcohol decreased very markedly because the people could now drink water. A third reason, then, for having pure water is its effect in decreasing the consumption of alcohol.

There are three more or less common ways of purifying water. The first is by use of a filter. Filtering is a purely mechanical process. It acts in the same way as a sieve in removing all foreign materials from the water. Some germs are also removed, but usually not all of them. In addition to being filtered, water is usually treated chemically with some disinfectant. The disinfectant kills any disease germs which may have come through the filter. After disinfecting the water one usually has to neutralize the disinfectant so that its taste will not remain. The third, and earliest method, of sterilizing water is to boil it. Boiling kills the germs of any disease, and is therefore used for such purposes as sterilizing surgical instruments as well as for making water clean. When one travels in

primitive countries, it is still necessary to boil all the water. To be sure, the natives themselves often do not need to take these precautions because they have become immune through use of this water from infancy. Those who can not become immune do not live to grow up. The visitor, however, must boil the water or he will expose himself to whatever disease there may be in the neighborhood.

In a large city or in any place where there is a board of health which inspects the water supply at frequent intervals, it is safe enough to drink water directly from the faucet. As soon as one goes away from civilization, on a camping trip for instance, there is likelihood of infection, especially in some places. An old well often looks artistic; from it one can draw clear, cool water. Usually, however, the water is not at all safe to drink. A well is almost always on the slope of a hill or in a valley. If there are primitive toilets anywhere above the level of the well, there is sure to be drainage from these toilets down the hill. No matter how attractive the water in an old well may be, it should never be drunk before it has been either tested or boiled. The clear, bubbling mountain brook is also likely to be contaminated. If one were in a really untouched and untraveled wilderness, the water of a brook would be safe to drink, but along most brooks there are campers and cottages. In the neighborhood there is usually no adequate sewerage. A brook is less likely to be contaminated than a well because the water is at least in motion, but the camper should not be deceived by the apparent freshness and coolness of the water into thinking that it contains no germs. Finally, it is never safe to drink from stagnant water of any kind. Stagnant water collects in hollows that are the lowest places in the neighborhood. They do not have inlet or outlet because the hollow is lower than its surrounding banks. Any germs there may be in the soil

will therefore, in the course of time, drain down hill into the stagnant pond.

It is necessary that everyone should drink a good deal of water every day in order to be healthy. Water is necessary for the digestion of food and for the development of tissues within the body. The average individual needs about three quarts each day. Milk, coffee, cocoa, ginger ale, and so on, all contain a high portion of water. These various liquid foods, in addition to the drinking water, supply a sufficient amount of liquid to maintain the body in a normal state of health.

A. _____

B. _____

1. _____

2. _____

3. _____

C. _____

1. _____

2. _____

3. _____

D. _____

1. _____

2. _____

3. _____

E. _____

Naturally, a teacher will select only materials that can be outlined! If she takes an excerpt from a textbook, she will probably need to add a sentence here and there and to delete occasional material that is

irrelevant. The best source for exercises of this type are books in history, geography, or any of the sciences. She will also find useful pages in the basic readers for all the elementary grades. Any of these readers will contain an occasional short article on some such subject as "Why the Dew Falls at Night" or "Why Flies Are Dangerous." These topics are already condensed into a limit of two or three pages and are, in general, outlinable.

It is desirable at first to present at the end of the exercise—as in the sample shown above—a skeleton outline; that is, the appropriate letters and numbers but without any written material. This skeleton is of considerable assistance to pupils when they first start to find the interrelationship of another person's ideas. It is not, of course, necessary for the pupil to get into his outline every single fact included in the pages read. Indeed, the outline should be regarded as a means of organizing into small compass only the *main ideas* of a selection. Even though minute details can be put into an outline, there is no reason why they should be. If they are included, the outline will be about as long and certainly as cumbersome as the reading material itself. The idea is to obtain a condensation, not a reproduction. In later exercises of the series the pupil may be asked to supply the entire outline, numbers and all.

The pupil first reads the entire exercise through once. He next takes a separate sheet of paper, writes his name and the number of the exercise at the top, and copies onto it the skeleton outline found at the end of the exercise. He then goes back to the beginning, rereads the material and fills in his headings. It is essential that the pupil should get into the habit of reading through the material before he begins to out-

line it. One of the worse faults in the note taking of older students is their habit of beginning to write down notes with the very first sentence, long before they have any idea what a chapter is going to contain. It would be undesirable to build up this bad habit through a remedial exercise! The pupil should not be allowed, therefore, to omit the essential first reading. The pupil's wording of his headings may not correspond exactly with the wording on the answer card, but the headings should concern the same points.

9. *Reading Simple Diagrams*: Reading, in the minds of most teachers, is concerned exclusively with literary types of material. A pupil finds it necessary, however, to read maps, graphs, and diagrams in his textbooks for social, biological, or nonbiological science. Such nonverbal materials present real difficulties for the pupil. Very rarely does he obtain help in understanding them from his general training in reading. It seems desirable, therefore, to include a series of exercises that would give training in these special types of reading. A typical sheet from such a series appears on the next page.*

The pupil is to study each diagram and then answer the questions about it. The easiest and simplest diagrams are maps. The pupil occasionally finds bar graphs and curves in his books and as soon as he begins work in any science, he finds schematic pictures of various phenomena. In the textbooks pupils are required to read in the upper grades of elementary school and in the subsequent years, teachers can find plenty of materials for making up a series of this type.

The pupil studies the diagrams and then—on a

* The third diagram is used by permission of *Science and Mechanics*.

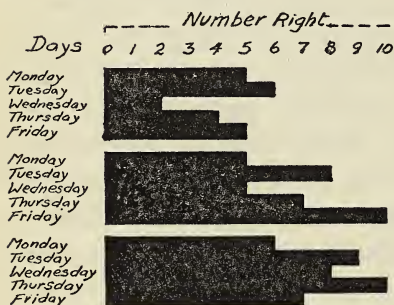
DIAGRAM 1



DIRECTIONS: At the left is a map of Australia. Study it and then select the best answer to each question.

1. Where is the biggest harbor?
in the northwest in the southeast
on the west shore on the east shore
2. Where would you expect to find plains?
in the southeast in the center of the island
in the western third and the north along each coastline
3. Where are the cities located?
near each other near the ocean
in the south at the foot of mountains
4. How many main divisions are shown? 6 3 5 8 16
5. In what direction does the biggest river flow? north southwest west northeast south

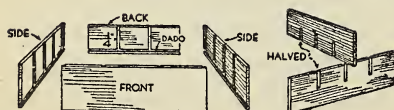
DIAGRAM 2



DIRECTIONS: This diagram shows how many spelling words John had right each day for three weeks. The days are shown down the side and the number right across the top. Study the diagram and then choose the best answer to each question.

1. What was the smallest number of words John spelled correctly on any day? 0 1 2 3 4
2. What score did John make most frequently? 10 7 3 5 0
3. How many times did John get all the words right? 3 5
4. During which week did John do the best work? first second third
5. How many words did John spell correctly during the entire first week? 6 35 5 22 40

DIAGRAM 3



DIRECTIONS: This diagram shows the parts out of which a drawer can be made. Study the diagram and then choose the best answer to each question.

1. How many different pieces are needed to make this drawer? 10 7 6 12 9
2. How many partition pieces would you need to go across the drawer from left to right? 1 2 3 4 5
3. How many small compartments would the drawer have when it was finished? 12 7 8 6 20
4. What do you think a "dado" is?
a measurement the back of a drawer a partition a groove a hinge

FIG. 13.—Sample exercises in understanding diagrams.

separate sheet of paper—writes the answers to the questions. These answers are then compared with those in the answer file.

10. *Summary:* The above series of exercises has been presented to give the teacher material by means of which she can do remedial work in comprehension. By using any book available to all pupils it is, of course, possible to include a little such work in regular classroom drills. In fact, most teachers do something of this sort from time to time. For drill purposes, however, the work must be systematic and intensive. The usual reading situation in class is too complicated for the introduction of many exercises of this character. The stories are too long, the paragraphs do not all contain central ideas, there is only an occasional paragraph from which an inference can be drawn, many selections cannot be outlined, and so on. It is much more efficient to isolate each one of these techniques for acquiring meaning and to concentrate upon each in turn. A teacher using even one series of exercises of the types above-indicated will find the comprehension of her class improving in a short time.

As stated at the beginning of this chapter, the main reason why pupils do not find meaning in what they read is that they are not looking for it. Each of these eight types of exercise requires the pupil to look for a different kind of meaning. If enough exercises are used to build up this habit of purposeful reading, a child has a method of procedure which can be transferred to his regular assignments.³ He knows what kinds of meaning one can discover on a printed page and as a result he is able to read his regular assignments, or anything else, with far higher comprehension than before because he has learned what to look for.

ACTUAL EXPERIMENTS IN INCREASING
COMPREHENSION

Three experiments will be summarized briefly below. These are included to show what progress may be made when one has the proper materials at hand. It will be seen that these experiments could not have been carried on without the use of special types of exercise.

(1) A junior high school teacher of remedial reading had twenty-two pupils in her class. During the previous semester she had constructed five series of exercises in comprehension of the type described in this chapter. For each exercise she had a complete series, starting with five at the third-grade level and continuing with ten for each successive grade throughout the ninth. Her method of application was simple. At the beginning of the course she started the pupils on the first type of exercise, using third-grade materials. The pupils worked in pairs and checked each other. As each child showed ability to read exercises for one grade he was promoted to the next. This work continued until each pupil in the room had either completed the ninth-grade exercises satisfactorily or had proceeded as far as he seemed able to go. Those who completed the series first were kept busy with other assignments until the last pupil was through with the first type of exercise. Then the entire class started together on the second type, beginning as before at the third-grade level and proceeding as rapidly as they could through the ninth grade or as far up the series as was possible. When all had finished the second series, they began the third. The pupils needed nine weeks, a period a day, to complete the five series. The

gain in comprehension, as measured by a test whose items were of a type *not* included in the training series, was marked. At the beginning the average standing of the group in comprehension was slightly below the fifth-grade level; at the end it was nearly seventh-grade. In the relatively short time during which the exercises were used, these pupils had gained 1.8 years in reading comprehension—even though many of them were not yet up to their grade placement.

(2) In one school ⁷ 32 pupils were given special training in remedial reading from November until the following May. They received help in both speed and comprehension. In the latter field they analyzed the plots of stories, selected significant sentences from paragraphs, found the main idea of short passages, and crossed out extra words that had been inserted into sentences. To increase their speed these children did all their reading silently, timed themselves on short paragraphs daily and on longer selections twice a week, and worked with flash cards to widen their eye span. At the beginning of the training period only 3 of the 32 pupils made reading scores on the Monroe Test of more than 80 points. At the end, 26 children—or all except 3—made scores above 80. In comprehension only one child started with a score above 15, but 27 had scores of 15 or better at the end. As a group these pupils showed an average gain of $1\frac{1}{2}$ years in comprehension and $3\frac{1}{2}$ years in speed.*

(3) The third experiment to be described was carried on with college freshmen.¹⁶ These students had been given a two-hour test of intelligence and a one-hour test of reading. There were 606 freshmen who

* On the Courtis Test, which was also used, the gains in these two fields were respectively $1\frac{1}{2}$ and $2\frac{1}{2}$.

scored in the lowest 25 per cent on the reading test. Their scores in intelligence ranged from first to the 79th percentile. These students were paired according to their intelligence scores, beginning with the two who made the highest scores and continuing down to the two who made the lowest. These pairings were made within the first week of school, before anyone knew anything more about the students than their names and scores. The first member of each pair was then chosen for training.

The 303 students who made up the training group were all given a second reading test, as a check on the reliability of the first. Only 29 of them succeeded in making a higher score than the 25 percentile. These few were excused. The remaining number—274—were assigned to the remedial reading class. It then appeared that 39 of them could not come to any section of the class because of conflicts in their schedules. These were also excused, leaving 235 students. Before the end of the semester there were further casualties. Three of the students withdrew and eleven never attended class; 36 started the exercises but stopped less than halfway through, and 44 did not appear in class until Thanksgiving time—just after they had received warnings in one or more subjects. Those in this latter group finished the exercises, but since they rushed headlong through them during the last three weeks of the quarter in a vain hope that by this means they might salvage at least one course from probable failure, it is unlikely that their training had any effect upon the marks they received in their first-quarter classes. All students in the various groups above described were crossed off the original list, leaving only

141 who came to class from the beginning and completed the work.

These students took four series of exercises, each of which included four levels of work. The successive exercises in each series were taken from books used in junior high school, senior high school, and freshmen year in college. For the fourth step, selections from each student's own current textbooks were used. By means of this last procedure, the training gained through the previous exercises could be most directly transferred to the reading matter for the courses in which the students were then enrolled. Each student took as many exercises at each level as he thought he needed and then went to the instructor for an examination. If he passed this test, he proceeded to the next level; if he did not, he went back and took more exercises of the same degree of difficulty. Each student continued his work until he had completed the four series. He was then dismissed.

It will be remembered that originally there were 303 pairs of students. If one member of a pair that had been formed on the basis of the original test results had left school, had been excused, or for any reason had not completed the exercises before Thanksgiving recess, *both* members of the pair were dropped from the results. In the final statistics, then, there were 141 pairs of students. One member of each pair had been trained, while the other had not.

The results of this experiment were measured in terms of class marks, from which grades in physical education, military training, and hygiene were excluded. For each group the total hours of A, B, C, D, and E work are shown below:

	MARKS MADE BY THE TRAINED STUDENTS	MARKS MADE BY THE UNTRAINED STUDENTS
A	91	20
B	338	114
C	934	726
D	443	680
E	362	628
Total	141	141
Average point-hour ratio	1.7	1.4
Median intelligence	16.3	16.3
Median number of hours carried in fall quarter	15.3	15.3

Examination of the above table shows that the trained students made over four times as many A's, approximately three times as many B's, a third more C's, a third fewer D's, and slightly more than half as many failures. These differences in the final grades were not due to differences in intelligence, since both groups had the same range and the same average. The amount of academic work taken during the first quarter was also identical, as to both average and range.

These results may be summarized in a more interesting and practical manner. One may assume that if the trained students had received no help, they would have made grades approximately equal to those received by their untrained partners. By a comparison of their actual marks with those they would presumably have received without training, one may come to the following conclusions about the value of the remedial reading class for these 141 college freshmen: the course resulted in an excess of 71 A's, 224 B's, and 206 C's above the probable number as well as 239 D's and 262 E's less than the expected total.

From the three foregoing experiments it can be seen that remedial training in comprehension produces results. There would seem no reason why pupils at

any level of school should not improve their comprehension, if the teacher has at hand the appropriate materials for this type of work.

S U M M A R Y

Comprehension can be improved by any technique of teaching that shows children how to look for meanings. The essentials of the desirable training are that it should be systematic, of adequate length and at all times so clear in its nature that children always know what they are looking for. Whatever exercises or other material may be used must show pupils how to find ideas through the medium of words. By using such types of drill materials,^{5, 8, 10, 14, 15, 18, 19} one is justified in hoping for a significant improvement in a relatively short time.

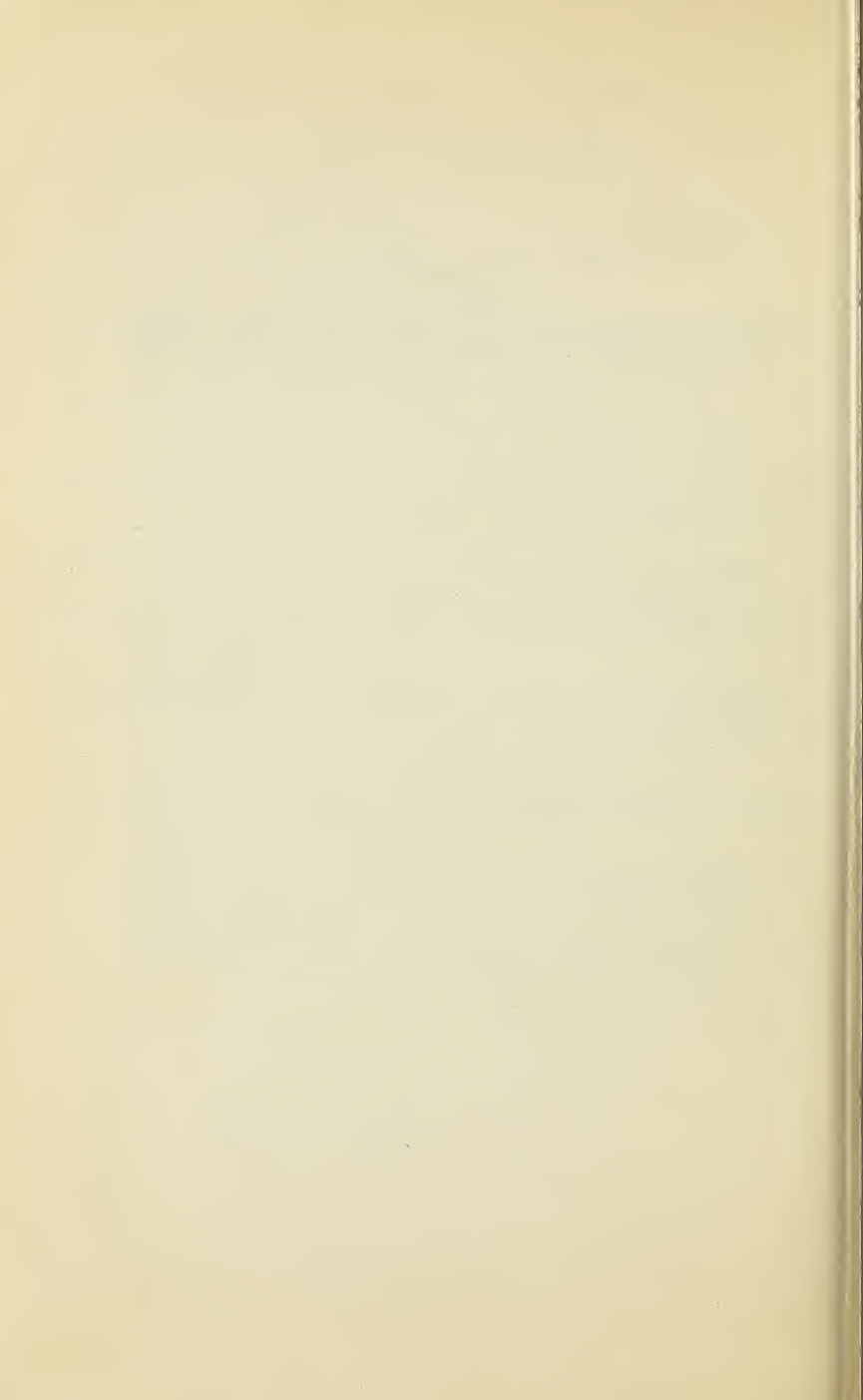
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PART V

SPECIAL PROBLEMS IN READING



XIII

THE NONREADER AND THE NERVOUS READER

THESE two types of pupils present special problems to the teacher of reading—the first because he reads practically nothing and the second because his performance varies so markedly from day to day. Neither child's difficulties can be remedied by the procedures described above. For the nonreader the exercises are far too hard, and for the nervous reader they are too exacting, and often irrelevant; what a nervous child needs is less reading rather than more. There are not many children belonging in either of these two groups. It is the writer's guess that there is at least one nervous reader in each room in the average school. In most first-grade rooms there is at least one nonreader; if a school is located in a poor district, there are likely to be two or three nonreaders in each entering class. The particular difficulties of these two types of pupils will be taken up in order.

THE NONREADER

1. *Types of Nonreaders:* A child may be considered a nonreader if at the end of a year of instruction he is able to recognize less than 25 words. It is rare for a child to be unable to recognize any words at all, although this situation occasionally appears. There are

numerous causes for an inability to read. The time to analyze a child and find out what is interfering with his learning is at the end of his first year of school. He cannot continue as a nonreader any further than the end of the second grade, at the most, and still progress at a normal rate. Up until that time he can compensate for his failure to read by listening, but with the beginning of the third grade he falls increasingly further and further behind other members of the class because so much material is presented in written form. Handwriting, music, physical education, and drawing are the only subjects that are relatively independent of reading, and none of these usually enter seriously into the teacher's consideration when she promotes children. It is therefore necessary that the nonreader be studied by the end of his first year of school so as to leave his second year free for remedial work; otherwise he will become retarded and discouraged.

The first point in considering a given child is to make sure that he is not a general defective. If a child has an I.Q. of less than 75, he will not learn to read for some years after entering school, for the same reason that he will not learn arithmetic, spelling, or any other subject. Not only defectives but stupid children—those with I.Q.'s from 75 to 85—are not yet ready to read when they enter school. Since a mental age of at least $6\frac{1}{2}$ is needed before a child can begin to read, a child with an I.Q. of 80, for instance, must wait until he is about eight years old before he has the necessary mental age. Such a child must therefore remain in school about two years before there is any use in trying to teach him to read. The first step, then,

is to determine a nonreader's I.Q. and mental age. If these are low, the situation is adequately explained.

If a child is reasonably normal in intelligence (that is, has an I.Q. between 85 and 115) the next step is to test his eyesight, hearing, and speech.³ Many nonreaders have a definite defect in one of these three fields. Defective vision interferes with learning because the child does not get a clear picture of the words. Moreover, his eyes are likely to hurt, and he will avoid looking as carefully as he should. Defective hearing interferes with learning to read because a pupil does not get a clear sound of the words as the teacher pronounces them. In fact, defective hearing has operated before he ever entered school to produce an abnormally small vocabulary. Consequently, many words that a child with normal ears recognizes as soon as they are pronounced, a child with defective hearing does not recognize at all, because they are not within his speaking vocabulary. Defective speech interferes with learning to read because the child's first reading efforts consist of pronouncing words either aloud or to himself. By his pronunciation he gets the feeling of the word in his vocal apparatus; in addition, he hears himself say it and thus obtains more oral drill. The child with defective speech gets the wrong muscular co-ordination; moreover, when he listens to himself he hears the wrong sounds. For instance, if he pronounces all *th*'s as if they were *s*'s, he will say "sis" for "this," "mons" for "month," "tees" for "teeth," and so on. These mispronunciations he is not likely to recognize. The normal child uses his eyes, ears, and muscles simultaneously to reinforce one another; if a pupil is defective in any of these three respects, he may become a nonreader.

If a child is not feeble-minded and has no specific sense defect, the next point to be considered is his home background. If he hears another language continually at home, he will learn to read English at an abnormally slow rate. The bilingual child eventually acquires two languages but, unless he is unusually bright, he learns both of them at a slower rate than a child of the same ability who hears and learns only one. For example, a child who hears only Dutch at home will have at his entrance to school a speaking vocabulary of perhaps a thousand Dutch and a hundred English words; his knowledge of English is therefore far too small to act as a basis for reading. Unless he is given much more assistance in pronunciation than is usually the case, he will transfer Dutch sounds into English, thus mispronouncing the words as he repeats them to himself. By this procedure he subjects himself to the same undesirable treatment as if he had a speech defect. Under ordinary circumstances first-grade instruction is continually reinforced in the child's home, because he is learning only words that occur in everyday speech. The child who has been taught the words "see," "dog," "the," "go," and "home" on Monday will probably hear all of them used several times before he returns to school on Tuesday. The child of foreign parents will not hear any of them, and by the time he comes back to school on Tuesday he will have forgotten at least some of them. His experiences outside of school destroy what he has learned, instead of reinforcing it.

If a child has normal intelligence, normal sense organs, normal speech, and hears English at home, there still remain three possible explanations of his failure to learn to read. The most likely is that he

made his first efforts at reading when he was too young.^{1, 2} If he entered school a few days after he was six and had a normal intelligence, he was still half a year below the necessary mental development. Whenever the first attempts to read have been made before a child is mature enough mentally, he is almost certain to develop the fatalistic attitude that reading is—for him—impossible. His emotional experience is much the same as that of a person who, during his first attempt to swim, is ducked and half-drowned by inconsiderate acquaintances. Such a person develops a horror of the water and a fixed conviction that he can never learn to swim. Either he will not go into the water and therefore fails to learn, or—if he does succeed in getting himself immersed—he is so apprehensive, so nervous, and so tense that he can make little progress. The child who has attempted reading at too early an age has had an almost identical emotional experience. Either he stays away from reading or he is so apprehensive and so unsure of himself that his progress is emotionally blocked. Many children of this type are docile enough on the surface. They look at the required book the required number of minutes, but they apparently do not see anything; that is, they are staying away from water. On the other hand, a child may make tense, frantic, desperate efforts to remember words—but the underlying conviction of failure is so fixed that his efforts are to little avail.

Another reason for failure in a perfectly normal child is merely lack of experience. Some children never have to read anything to themselves at home and therefore expect the teacher to read aloud to them in school. Some parents baby their children for years by reading all books to them. The writer was once asked to

analyze the reading difficulties of a college freshman whose reading score was approximately fifth grade, although he appeared to be of normal intelligence. It developed that this boy had never read a lesson to himself. Throughout the elementary, junior high, and high school years every assignment had been read aloud to him. With his increasing mental ability he had, from year to year, picked up a little skill in reading until, by the time he was eighteen, he had progressed to fifth-grade level.

No child gets enough experience in his reading in the schoolroom to learn the number of words he needs to know. His reading in school must act as a basis for the reading he does outside. Unless he has this additional practice, he does not learn to read well, simply because he never has enough practice. He is in much the same state as the child who takes a music lesson twice a week and never practices between lessons. If for any reason whatever a pupil reads only when required to do so in school, he will certainly be a poor reader. Inexperience alone will not produce a non-reader, but inexperience plus immaturity, or inexperience plus hearing a foreign language, or inexperience plus a defect of any kind, is likely to produce a child who does not read.

Finally, there is the perfectly normal child whose visual memory is either poor or practically nonexistent. It was pointed out in the first chapter, and emphasized at various points since, that modern methods of reading are based almost wholly upon visual presentation. Such teaching presupposes that a child has an adequate visual memory. This attribute, like all other human characteristics, varies from those who have such a good visual memory that they remember

the exact appearance of any word they have ever seen, to those who cannot call up the image of any word whatever. Incidentally, the extremely good spellers are recruited from the former group, and the hopelessly bad from the latter. If a child with weak powers of visualization happens to be taught by a teacher who uses only visual presentation, he is quite certain to become a nonreader. If the teaching to which such a child is subjected is largely phonetic, he will slowly learn to read, because he is supplied with a technique for substituting sound for sight. He may not learn to spell, but the phonetic work will be sufficient to develop in him a moderate proficiency in reading. This matter of poor visual memory is almost completely overlooked by most teachers.

2. *Diagnosis and Remedial Work for the Non-reader:* If a child is mentally deficient, he should be put as soon as possible into a class for children of this type; he should not be taught to read until he has developed a sufficiently high mental age. If a pupil has a defect in vision, hearing, or speech, all reading instruction should be suspended until the defect has been remedied, providing it is remediable. If the condition is permanent and severe, the pupil cannot be taught by ordinary methods and must be put in a special class for children with such defects. If a defect is permanent but only slight, then the teacher must adapt her methods, in so far as she can, to take account of the situation. Especially must she teach the pupil how to compensate for his condition. That is, she must teach the child with defective vision to use his ears and speech to the greatest extent, the child with slightly defective hearing to concentrate on remembering appearances rather than sounds, and the child with per-

manently defective speech to concentrate upon his visual memory of words and other people's pronunciation, at the same time disregarding his own.

If a child hears little English outside of school or if he is normal but immature, the teacher must wait for sufficient emotional, intellectual, and linguistic development to serve as a basis for learning to read. During this period of waiting all ordinary instruction in reading had best be abandoned. The foreign child should be taught to speak English until he has a vocabulary as large as that of the American child upon entrance of school. The immature child should be given a semester, or if necessary a year, until he develops sufficient maturity to learn reading. There is nothing to do but wait.

If a child is emotionally blocked because of unfortunate earlier experiences, he should be excused from any reading drill whatsoever. Every time he tries to read, his emotional attitude becomes more deeply stamped than before. The first thing he must do is to forget how he feels about reading in general; at least a semester, plus a summer vacation (or vice versa), is needed. The period should be long enough for the child to achieve an increased maturity and for the earlier emotional discomfort to fade into forgetfulness. During this time he should be allowed to do something he really likes to do whenever the other pupils are reading. If the abandonment of reading leads to a failure of promotion, this is unimportant. The significant thing at first is to relieve all emotional pressure. It is often desirable to send such a pupil out on the playground whenever the class is reading, thus removing him completely from the situation that has caused him discomfort. There is always some

group on the playground having its physical education period; he can simply join this class every day and become an integral member of it, even though the children happen to be smaller or larger than himself.

When the period of rest is over, the teacher should talk to the pupil, explaining to him exactly what his trouble was. She should tell him that he was taught to read when he was too young and that he could not learn because he was immature. She should tell him that any child would have reacted in just the same way, that there is nothing abnormal about him, and that he is now old enough so that he can learn easily. It is desirable to have him give examples of other things he could not do when he was six years old but now does without effort. For instance, he probably could not throw a ball efficiently at that age, although he now throws one easily; perhaps he could not whistle when he was younger, but can now do so. Such examples will make clear to him how his increased maturity has made possible many things which were impossible when he was six. With this prelude the teacher is ready to begin her instruction.

It is absolutely essential that she should start with extremely small assignments. She can, for instance, prepare five cards, upon each of which she has printed a single common word. She can teach the child these five, then change the order of the cards and have him repeat them, continuing until he has learned them all. It is desirable to select five words that can be arranged into a sentence. When the pupil has learned the isolated words, he should be allowed to make a sentence out of them and then read the sentence as a whole. Many children learn new words best by tracing them.^{6, 11} The next day's work should consist of these

same five, plus one or two more, which can be worked into the original sentence. On the third day, another word or two may be introduced. Then a new sentence had better be started. When two or three sentences have been learned in this way, the teacher would do well to start with some of the phonograms and train the child with word families until he has learned the basic sounds. Training may then take the form of the simplest exercises. The pupil is given about ten cards, on each of which the name of some object is printed. He also has pictures of the objects. His job is to learn the pronunciation of each word and then to place the cards beside the pictures. After he has done this, the teacher corrects any errors he may make, shuffles the cards, and has him do it again until he has learned these words perfectly.

During this initial period two things are essential. First, the pupil should not be asked to do any consecutive reading and second, the amount of word study per day should be small. It is desirable that the pupil should have a copy of every word he has learned, whether in word-families or in any other way; each word should be printed upon a card which should be kept in a file. He can then give himself drill by running through this file whenever he has time. It is not until he has built up a vocabulary of at least 200 words—and 300 is a safer total—that he should be asked to read a story. The teacher should first go over the selected story and check the words used against the pupil's vocabulary. There will be some unfamiliar words; these she should add to his list. He must not try to read the story until he can recognize, in isolation, every word that will appear in it. That is, the child should not be asked to read consecutive material

until he is *absolutely certain to be successful*. Once a pupil has succeeded in reading easily even the simplest story, he regains his self-confidence, the already half-forgotten emotional blocking disappears, and he is no longer a nonreader. He is merely an inexperienced reader.

If a teacher suspects that a child does not have a normal degree of visual memory, she may determine his powers by a simple test. She prepares a few cards such as that shown below:

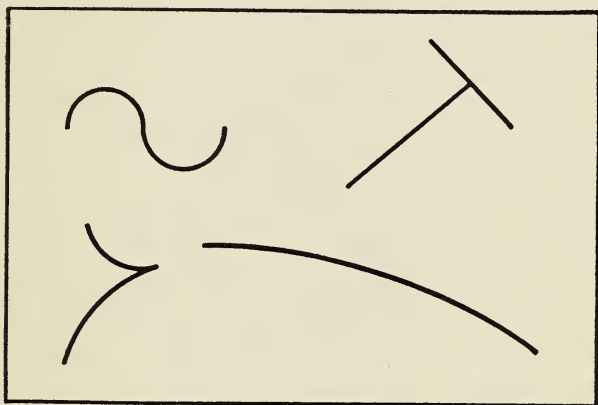


FIG. 14.—Sample test card for visual memory.

The lines and other geometrical figures should be completely meaningless and should be distributed on the card in a purely random fashion. Five symbols are enough for one card. The teacher shows the child the card for ten seconds, takes it away, and asked him to reproduce on paper what he saw. There is no way of remembering what is on such a card by any verbal means, so the child must depend upon his visual memory. If he cannot reproduce more than one or two lines, his visual memory is too weak to be used as the

sole basis for learning to read. The teacher must therefore present words to him by means of his ears and speech. He needs intensive work in phonics, accompanied at first by complete vocalization. Unlike the child with good visual memory, who can learn to read with a minimum of inner speech, such a child cannot learn without pronounced vocalizing. He should recognize words by sounding them, writing them, tracing them, and hearing them. For instance, when the teacher presents the word "thing," she should pronounce it with an exaggeration of each sound; then the pupil should pronounce it; then he should whisper it over and over to himself. In short, he should be taught by the "good old-fashioned method." This performance is roundabout and inefficient for a person who can depend upon visual memory. Not more than one or two children in a hundred have such poor powers of visualization that they do not learn by ordinary methods, but the child who cannot remember what a word looks like must substitute his other senses. He will then learn, even though progress may be slow.

The ordinary classroom teacher is not equipped to deal with nonreaders. The small number who exist in any school system can best be put into a group by themselves, regardless of grade placement. Here they are first analyzed and then taught by whatever methods seem appropriate. The whole matter is highly technical and complicated. No classroom teacher has either the time or the training to deal efficiently with the nonreader.

Lester was ten years old and had a mental age of nine. He had been in school for five years but was still unable to distinguish one-syllable sight words. A little

remedial work in a small class had been tried but without results. Finally Lester was placed, more or less by accident, in a class with a number of poor spellers. These children were taught spelling by looking at words, pronouncing them, tracing them with their fingers, and writing them. Children who wished to do so might trace any word several times, provided they did not copy their own writing. In a short time Lester developed a craze for writing words. He would work at it by the hour, tracing words over and over again. As soon as he had learned a number of words in script he was given the printed form. Recognition was almost immediate for those words he had already written. In a few weeks he was learning several new words a day. After about two months he was able to look at a new word in print, say it to himself, and then write it clearly. After he had once written a word he could almost always recognize it on later presentations. Yet after hearing a word over and over again he could not recognize it unless he wrote it. At the end of six months he was reading easily and was returned to the regular classroom. Four years later the boy was doing excellent work in the seventh grade.^{6, *}

THE NERVOUS CHILD

Perfectly healthy people rarely understand the problems of the nervous pupil. A nervous child is so sensitive to all stimuli that he is constantly overstimulated and cannot relax. In fact, his essential difficulty is this constant nervous tension which produces abnormally early fatigue and prevents normal relaxation. He cannot relax enough to sleep at night or to digest his food. As a consequence, his vitality is low, and he is more susceptible to infection than are other

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children; by the end of an ordinary school day he is pale, his hands are clammy and unsteady, his eyes are abnormally bright, and he is in general "wound up" so tight that he cannot stop his activity. The nervous child further shows his condition by becoming excited much too easily and by being overeager to participate in whatever is going on. For example, if he knows the answer to a question, he not only waves his hand frantically but jumps up out of his seat and—if not promptly called upon—shouts the answer anyway. He is far too active; the most difficult thing in the world for him is to sit still. There is hardly an instant throughout the school day that he is quiet. From a teacher's point of view his most bothersome symptoms are undoubtedly his inability to stop talking and his constant squirming. When a teacher stimulates her class by telling them how anxious she is to have them do their best, the nervous child overacts to her remarks and starts a terrific flurry of work. His tension will not allow him to relax and rest, so he keeps on driving himself until he is exhausted. Before school is over, he is irritable, jumpy, and quite unable to concentrate.

The nervous child should not be confused with the pupil who is suffering from an emotional complex. Few nervous people are emotional. Most of them rush from one thing to another too fast to become worried about anything. Undesirable home conditions doubtless add to a nervous pupil's general fatigue and prevent such little relaxation as he might otherwise achieve, but he does not often develop any deep emotional concern for social conditions. These children have, indeed, so little inhibition that no emotion is ever suppressed long enough to develop into a com-

plex! Nervous children do not show abnormal behavior; they show simply too much ordinary behavior.

So far as reading is concerned, the nervous pupil's work may be excellent, average, or poor—according to his native intelligence and the methods by which he has been taught. Whatever his average level of performance may be, he constantly shows wide variations from it. Any child varies somewhat around his own average, but a nervous pupil's performance is entirely unpredictable. If he is a good reader he is likely to be the best in the class when he is sufficiently stimulated, and the worst in the class when he is tired and irritable. He may show any of the reading defects described in the foregoing chapters. In short, his reading abilities may be of any level and may show any possible combination of characteristics, although he is a little more likely than not to be a relatively poor reader.

The treatment of the nervous child has nothing to do directly with reading, although the treatment recommended will, by lessening the child's tension, eventually lead to better work in reading and in all subjects. The treatment consists essentially of a removal of stimulation and pressure. The three basic principles of the desired treatment are isolation, rest, and adequate feeding. No child who goes to school every day is isolated in the least. If he is very nervous he gets too little rest and is too tired to eat enough—and what little he does eat will not digest properly. No nervous child ever wants to miss school. School is exciting and stimulating, even if he is not in the least interested in the subject matter. But there are other children there, and many opportunities for play, and lots of interesting things to do. However, the last thing

a nervous child needs is precisely the excitement he craves. He should therefore be kept out of school for at least half the day. One cannot prevent a nervous child from becoming overstimulated by the presence of other children but one can keep him from being where the other children are.

A nervous child cannot be given the best possible treatment unless his home is willing to co-operate with the school. The procedure suggested below is the ideal one. In the case of individual children one has to approximate such a treatment as nearly as possible in view of the existing home, parents, and school. If feasible, however, the nervous child should spend his days in the following manner: He should have his breakfast in bed and should remain there, or at least in his own room, until after twelve. There is no objection whatever to his having his school books with him. He can be given some practice exercises in arithmetic, a booklet of spelling words, and an assortment of exercises or other assignments in reading. If a nervous child is of average intelligence he will keep up with his grade by his own efforts. The difference between his own room and the school situation is that by himself he will not study beyond the first symptoms of fatigue. If he is reading alone and gets bored with the work, he will put the book aside, whereas in school he would undoubtedly finish the assignment. When he is by himself and relaxed, he can stop. When stimulated by the presence of other pupils and the general drive of the ordinary schoolroom, he cannot stop, no matter how tired he may be. It is essential that the child's mother or other members of the family should leave him alone during these morning hours; if there is anyone within reach of his voice, he will talk continually and will

work himself up into as great a state of excitement as if he were in school. If left to himself he will study not more than half the time and will spend the remaining half in coloring pictures or playing other quiet games by himself. He will do some one thing until he feels tired and then, because there is no outside pressure, he will stop and do something else.

The child's lunch hour should be about 11:30, so that his food will be well on its way to being digested before the afternoon session of school begins; it is, of course, undesirable to isolate a child completely from his own friends, unless he is actually sick. A nervous child does not, however, need a full day of companionship; in the course of the short afternoon session he will talk to everybody in the room and get all the social intercourse he can stand. In general, the afternoon session of school is devoted to group activities. These do not make as heavy demands upon vitality as the drill in subject matter which usually fills the morning period. Moreover, the shorter afternoon session provides a larger number of social contacts than the longer morning session. That is, the pupil who attends only in the afternoon can enjoy the social benefits of school without being subjected to its pressure. After school he may be allowed to play with his friends until about 4:30. Because contacts with children in and after school are exciting and stimulating, it is imperative that a nervous child get back to his own room, with its quiet and isolation, early enough to relax before dinner; otherwise his food will not digest. He should eat his dinner alone. In fact, nervous children should not—except as a special treat—be allowed to eat with others. If there is anyone else present, the child will talk himself into a state of excitement, and then his

food will not digest. When he comes in from play, it is best for him to take a prolonged warm bath, put on his night clothes, get into bed, and amuse himself with quiet games until dinner time. After dinner he should continue to be alone until about 7:30 o'clock, when he goes to bed for the night. If he has been at home and gradually relaxing since 4:30, the chances are good that he will go to sleep immediately and sleep all night. It is most undesirable that he should be awake and tossing about in bed, getting more excited and wide-awake every moment. He should therefore have at his bedside a thermos bottle of warm milk, some simple stories to read, or some pictures to color; the milk will start the relaxing process and the simple forms of activity are enough to divert without exciting him until he feels sleepy.

Even with the best of efforts, few homes are able to carry out such a program in its entirety, although most parents are willing to do what they can. If the home is unco-operative, the school has to step in and give the child his periods of relaxation during school hours. Any school needs two or three small rooms where such nervous pupils who cannot be looked after at home may spend at least the morning sessions of school, and sometimes the afternoon sessions as well. If the school has a cafeteria or if the children bring their lunches, there is no reason why the child cannot have his lunch by himself. He can soon learn to run his own schedule of work. The lessons he studies should be approximately those given in his class, but he should have on hand a number of quiet games to mix in with his schoolwork whenever he feels tired. Most nervous children will not sleep in the daytime, and they will not remain idle without wearing them-

selves out more than they do when they are occupied. In any case, the essential thing is to provide isolation for these pupils.

No matter how bad a reader a nervous pupil may be, he should *never* be put into a remedial reading class. In such a class he not only complicates unnecessarily the task of the teacher by his overactivity, but he works himself into a worse state of exhaustion than ever because he has more reading to do. The whole arrangement in the remedial reading class is purposely made stimulating. The nervous pupil gets thrilled by the variety of things to do, but he wears out under the constant pressure for intensive work. What he needs is less reading, not more. If nervous children did not read at all for a year, except as they occasionally dipped into a book for their own amusement, they would—in spite of the lack of practice and the inevitable forgetting—read better at the end of the year than at the beginning. It takes courage for a teacher to recommend that a nervous child be dismissed from work. The school authorities and his parents both assume that he will fail to get promoted, that he will continue through school with a group of younger children, and that he will lose his contacts with his own group. None of this need be true. The pupil needs merely to have his environment so arranged so that he can do his work quietly by himself. It is most undesirable that he should have any tutor or other assistance, because the presence of another person immediately overstimulates him and he starts talking. There are at the present time plenty of self-instructional materials in all the fundamental school subjects. Practice exercises usually provide their own answers; they contain explanations of how to proceed with each

exercise, and they give more fundamental training than the average child gets in class. A pupil who is equipped with practice exercises in reading, spelling, handwriting, and arithmetic does not need to fall behind in his work, but he should be allowed to do his studying without pressure, without stimulation, and without excitement.

Esther was very bright, but highly nervous. During the school day she was rarely still for more than a few seconds at a time. Her first-grade teacher had realized Esther's difficulties and had let her roam about the room as she liked, but her next teacher insisted that Esther stay in her seat and keep still. Esther tried her best to conform, but she was in constant trouble from her continual wiggling, twisting, giggling, and whispering. Moreover, she dropped things, knocked them off her desk, tipped them over, ran into people, shuffled her feet, and provoked gales of laughter because of the grimaces produced by her facial tics. At the end of an hour's work, Esther was as contorted as a pretzel. Before noon she was white with strain and fatigue. By the end of the day she was so "wound up" that she could not stop talking, from sheer excitement. The overstimulation continued after school hours, and Esther played until supper time in a sort of frenzy. Often she could not eat anything, because she could not sit still long enough to get her food down. After supper she would run about some more. When it came time to go to bed, she would insist upon reciting poetry to anyone who would listen. Even after she was in bed she went right on reciting to herself, saying the same poems over and over. She rarely slept before midnight and then did not sleep for long, because she moved about so much that the bedclothes were soon on the floor and the cold air

woke her up. Some nights she remade her bed eight to ten times.

Esther's reading performance was her teacher's despair. Some days Esther would read fluently and well. On other days she apparently did not know the simplest words. On still others she read so fast and carelessly that she got no meaning. Sometimes she did not even take the words in order but jumped about on the page, producing a complete jumble. Her teacher noticed that Esther usually started the week well and got steadily worse as the days went by. Esther knew she was not doing good work and strained every nerve to do better, but with each fresh application of pressure she became more disorganized, and her "good" reading days became less and less frequent, although there was still an occasional day in which she stood at the top of the class.

Everyone knew that Esther was nervous, but no one did anything more than to hope for the best. The situation could not go on indefinitely. During her third month in the second grade, Esther had a severe attack of chorea during which she nearly died. When she was well enough to consider going to school, she was at once all eagerness to rush back into a scene in which she found so much that was interesting and thrilling. Her doctor, however, had other ideas. For the next two years Esther did all her schoolwork at home. Each day she was allowed to play for a while with the other children after school in her own yard where her mother could call her into the house if she got too excited. At night a long hot bath and a massage provided enough relaxation to help her sleep. During the rest of her elementary and junior high school career, Esther attended school for only half a day. Since she was a bright girl it was possible to educate her to watch herself and to slow down her activities when she felt the beginnings of the "wound up" state approaching.

SUMMARY

The nonreader and the nervous child are difficult problems in a classroom. No teacher should try to do anything about them herself. She should turn them over to an expert. One needs a psychologist, while the other needs a doctor. Neither will profit by ordinary classroom instruction, which will merely discourage the nonreader and excite the nervous pupil. If there is no expert, a teacher's best procedure is to send these children out to take a quiet walk around the block during the reading period. The fresh air and exercise may do them some good; ordinary instruction in reading will certainly do them nothing but harm.

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XIV

READING READINESS

READINESS to read is usually thought of as a problem met only in the first grade. On the contrary, it reappears whenever a pupil starts a new level of work. One should therefore investigate a given individual for his readiness to read at the first grade, the fourth, the seventh, the ninth, and at his entrance to college. In each of these grades the pupil meets new types of reading matter; his work will inevitably be below the necessary level of achievement if he is not ready before he starts.

It is desirable to know what skills are necessary for beginning work at each of these successive levels. Such a schedule will be presented in the following sections.

READINESS TO READ IN THE FIRST GRADE

It has been an educational assumption that children are ready to read when they are six years old. Some children are, but a considerable proportion are not.^{1, 4, 6} To be ready, a child must have sufficient intellectual development, maturity of speech and sense organs, plus social and emotional maturity. Intellectually, he must have a mental age of at least six and a half—and seven years is safer. With a lower mental age than six and a half he will not learn to read be-

cause he does not have the intellectual development necessary for so complicated a procedure. Throughout the first year of school a pupil reads almost no words that are not within his speaking vocabulary. If, however, because of immature speech he does not use the expected number of words, he does not have the necessary background. If his pronunciation is defective, he will not recognize words after he has spoken them.

If his eyes are developing at a perfectly normal rate, at the age of six they are still too farsighted to see clearly so small an object as a word. It is not until a normal child is eight years old that one can be certain his eyes are mature. If he has normal six-year-old ears, he will still be unable to distinguish consistently between the sounds of "g" and "k," "m" and "n," "p" and "b," or any other pair of related sounds. A pupil is not ready socially and emotionally until he wants to read, until he has sufficient independence to work by himself for a few minutes, and until he has had the experience he needs to act as a background for his comprehension. The matter of necessary experiences is especially important in a school that serves a slum district, because the simple stories children read in the first grade often describe experiences a slum child has never had. He therefore not only fails to recognize particular words, but he does not understand the ideas even after he has learned the words. His first-grade reader will undoubtedly contain a story about a family getting into an automobile and driving into the country. The chances are that the slum child has never ridden in an automobile and he may never have seen a tree, a flower, or any growing thing. He has therefore not much idea what such a simple incident is about. Because of his environment he has

seen few pictures, has had few stories read to him, and has made few if any visits to the movies. He has not even had these indirect means to compensate for his lack of experience. There is no use in trying to teach such a child to read a story about a farm when he literally does not know what any farm animal looks like and has no conception whatever of the physical environment under consideration.

There are various series of tests that measure readiness to read at the entrance to school. Some of these involve so much equipment and technical experience that they are relatively useless for the first-grade teacher. The really essential measurements, however, can be made well enough by means of the simple techniques to be described shortly. These tests are by no means exhaustive, but they are sufficient to indicate whether or not a child is ready to read.

1. *Mental Maturity*: First comes a measure of intelligence. Although the Binet examination is doubtless the best, it demands a considerable amount of experience before one can use it. The average teacher will get more accurate results if she uses any one of the following tests: Detroit Primary Intelligence, Pressey Primary Classification, or Pintner-Cunningham Test.* These are all group tests. During the first week or two of school, only a few children can be tested at once; the teacher should repeat the examination as often as necessary until she has scores for everyone. From any of these tests a mental age can be obtained.

2. *Visual Maturity*: The second measurements concern the child's eyesight. Four tests are recom-

* The first and third of these is published by the World Book Company, Yonkers, N. Y.; the second, by the Public School Publishing Company, Bloomington, Ill.

mended, the last two of which require a stereoscope.* The methods of procedure will be described briefly below.

(1) The first test in the series requires that the child be able to distinguish between pairs of letters that look similar. It is not in the least necessary to read the letters. A few sample lines from such a test appear below.

y-g	l-l	i-i	v-w
b-d	o-c	u-v	r-r
d-d	h-k	e-r	t-t
m-n	j-i	p-q	z-y
a-a	y-y	r-s	f-t

All the child is asked to do is to tell, for each pair, if the two letters are the same or different. Immature pupils are unable to distinguish between letters that are similar in appearance. The tendency to reversals, which distresses elementary school teachers, is merely a sign of immaturity. In a group of five-year-old children not more than 10 per cent will be able to pass such a test because they cannot see any difference between "d" and "b" or "p" and "q." By the time children are six years old, about half of them have sufficiently mature eyes to see these reversals. It is not, however, until children are eight years old that one can be perfectly certain the eyes are mature enough to avoid such confusions. A pupil's score on twenty such items as those above should be without error before he is allowed to begin reading.

(2) The second test is of the same type as the first, except that it contains words instead of letters.

* These tests are based upon Betts tests, but they have been greatly simplified.

The pupil is asked to tell if two words presented as a pair are the same or different. He does not need, however, to have the vaguest idea of what either word of a pair may mean. A few sample pairs for such a test appear below.

me-my	rat-rate	men-man	eye-eye
out-owe	save-save	zoo-zoom	did-hit
sent-sent	hope-shop	when-then	play-plow
we-woe	bead-bread	king-king	let-let
weigh-right	tall-tall	all-ill	put-pout

All the child is asked to do is to tell whether or not the two words are the same. If he cannot see differences in the appearance of words, he will obviously not learn to read. A pupil should give the correct answer to at least three-fourths of the pairs; otherwise, he is not ready to read.

The next two tests require the use of a stereoscope. In all, there are four cards to be prepared. Each of these cards is $7\frac{1}{8}$ inches long and $3\frac{1}{2}$ inches wide. They may be made out of any stiff white cardboard. Directions for making them will be given shortly.

(3) The first card of this series shows an upright line on one side and a circle on the other. A child thus sees a line with his left eye and a circle with his right. The teacher puts the card in the stereoscope and lets the pupil look at it. She first asks him if he sees a line (or stick) and a circle (or ball). Then she asks if the line is beside the circle. The pupil should answer that the circle is on top of the line—or that the line is under the circle. If his eyes fuse correctly, he will see the circle balanced on top of the line.

The second card has a horizontal line 3 inches long and $\frac{1}{8}$ of an inch thick on one side and, on the

other, a horizontal line 1 inch long and $\frac{1}{16}$ of an inch thick. When a child looks at this card he sees one line with each eye. If his eyes fuse correctly he will see

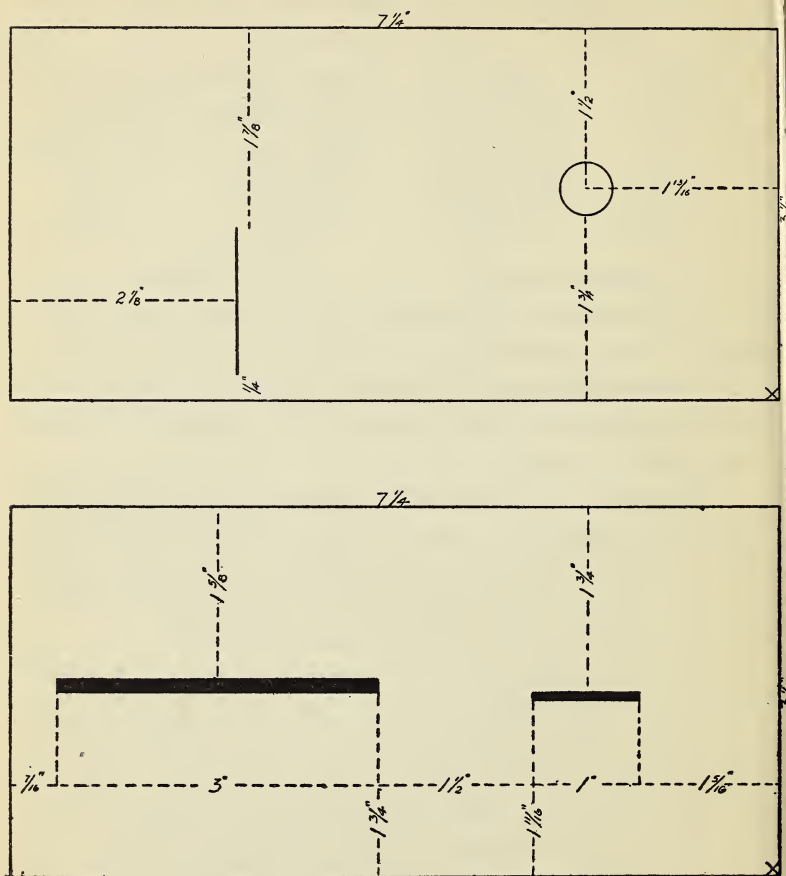


FIG. 15.—Stereoscope cards for testing fusion.

a single line because the one on the right will fuse with the longer line and will become invisible. One merely asks the pupil how many lines he sees. If he sees two, his eyes are not focusing; if he sees at first two and

then one, his eyes fuse eventually but the process is not sufficiently automatic for reading purposes. If a child's eyes are mature enough for the strain of reading, he will make no error on either of these two tests for measuring fusion. If the objects in either test constantly shift about, sometimes fusing properly and sometimes not, the child does not have sufficient visual control to read comfortably.

(4) The last test of vision also requires the stereoscope. It measures the muscular balance of the eyes. There are two cards; on the first, there appears a vertical arrow in the middle of the right field of vision and in the left field a column made up of dots and short lines. If the child's vertical balance is correct, the arrow will point to one of the dots, or between two of them. The teacher therefore asks him whether the arrow is pointing to a dot or line. If he reports that the arrow points to a line it does not make any difference which line. The plate is so arranged that only dots appear in the area of normal variability. If the arrow points anywhere outside this area, a lack of muscular co-ordination is indicated.

The last card is like the preceding one except that the dots and lines are arranged horizontally instead of vertically. The teacher again asks whether the arrow is pointing to a dot or a line. If the child sees the arrow as pointing to any line, his eyes are not ready to read until they have been corrected by glasses or exercises. Either vertical or lateral imbalance is likely to produce an aversion to reading because the eye muscles are not pulling equally, and the child must constantly strain the weaker ones to get a clear focus. Further fatigue arises when the focus is constantly shifting.

The construction of these cards is a fussy job, but it is not difficult. The plates shown above give the measurements of each line or other symbol, indicating

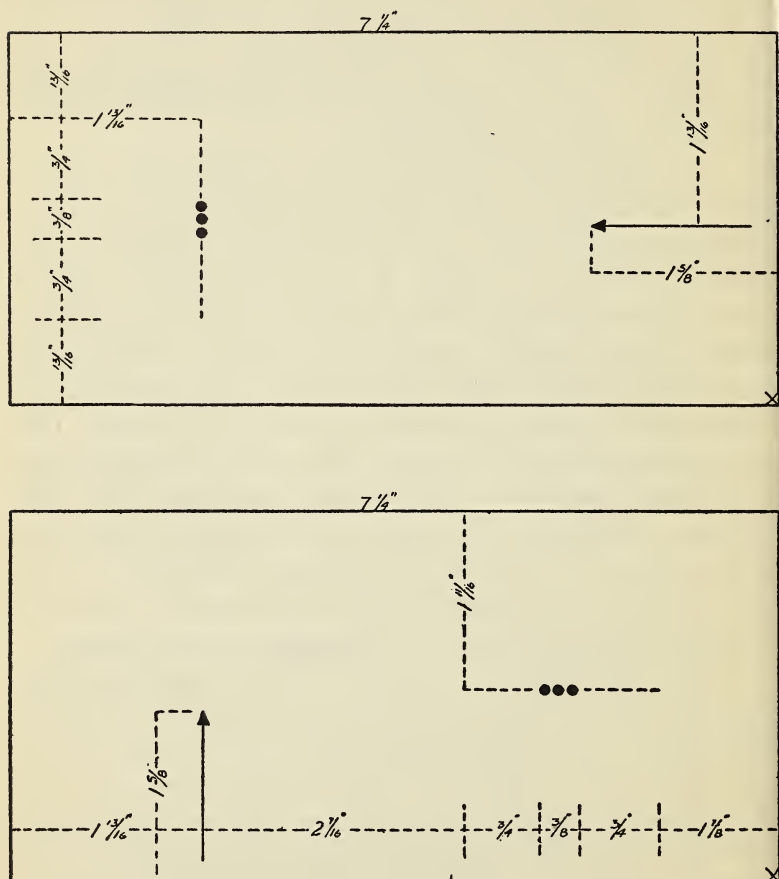


FIG. 16.—Stereoscope cards for testing imbalance.

both the dimensions of the object and its distance from both edges of the card. These measurements must be followed *exactly* or reliable results will not be obtained. It will be noticed that one of the two objects

on each card is slightly off-center. For stereoscopic vision it is necessary that the two objects should not both be placed in the same relative position on the two halves of the card. The precise amount of variation is given by the dimensions. The teacher is especially warned not to put the two objects in the exact middle of each field of vision; if she does so, there will be no correct fusion. Naturally, on the finished cards the constructional guide lines do not appear. The first card shows merely a circle and a line. The second shows two lines. The third and fourth each present an arrow and a column or row of dots and dashes. In one corner of each card there is a cross. The card should always be placed in the stereoscope so that this cross is in the lower right-hand corner.

These materials are not, of course, scientifically accurate. Better cards can be purchased by the teacher who can afford them.* Nevertheless, these cards, if accurately constructed, are good enough to point out the child whose eyes need attention. A scientific determination of the extent and nature of the defect is not the teacher's business: her job is done when she has found out which children have eyes that do not focus properly and has sent these children to an oculist.

3. *Auditory Maturity*: There are two simple tests of hearing that a teacher can use to find out if a child's hearing and his perception of what he hears are good enough for reading purposes. These tests are described briefly below: †

(1) For the first, the teacher says aloud to the child ten sentences, each six words long, such as "The

* The Betts materials seem to be the best available. See reference at end of chapter.

† These tests are also based on, or suggested by, Betts.

dog ran after the cat." The pupil is to repeat the sentence aloud after her. If he makes any error whatever, the sentence is counted as wrong. If he does not repeat at least five of the sentences correctly, his hearing—or his retention of what he hears—is defective.

(2) A second test requires the child to differentiate between two sounds. The teacher should use pairs of sounds, such as those that appear presently. The pupil stands beside her, but with his back turned toward her, so that he cannot get any clues from her lip movement. She tells him she is going to make two sounds or noises and that sometimes the two sounds will be just alike, while at other times they will be different. He is to tell her if the two sounds are like or unlike. She then sounds such pairs as are shown below:

b-d	th-sh	a-e	n-n	s-z	n-ng
s-s	k-g	f-f	oo-oo	k-k	a-ai
m-n	o-o	l-l	p-b	f-s	k-kl
r-gr	j-j	t-d	th-th	r-r	v-f

She should, of course, sound—not spell—these letters. The pupil should be able to distinguish correctly at least fourteen out of the twenty-four pairs, or his hearing is not good enough for him to learn to read.

If a pupil makes markedly low scores on these two tests, he should certainly be sent to an expert for ear examination. Although these tests do not measure the extent or cause of the deficiency in hearing, they are good enough to pick out the child whose hearing or perception is inadequate. It is then a job for experts to decide what should be done.

4. *Maturity of Speech*: A child's speech may be measured by asking him to imitate the sound of each

consonant in the alphabet (minus the letters "c" and "q"), plus the common combinations of *th*, *sh*, *ch*, *ng*, *kl*, and *gr*. This total comes to twenty-five different sounds. The pupil should face the teacher so that he may see her lip movement. He is allowed three attempts, if he needs them, for each sound. If the pronunciation is still incorrect, his effort is counted as a failure. He is not ready to read until he can imitate correctly at least fifteen out of the twenty-five sounds. Any defects of speech should be noted and later corrected before reading is begun.

5. *Emotional and Social Maturity*: There are no good measures of social and emotional maturity. A teacher must therefore rely upon her own observation of each pupil. The babyish child who constantly depends upon adults will not make much progress in reading, because he cannot work by himself. The pupil who persistently avoids looking at books, never asks—when he sees a picture—what the words under it are, and wanders off if left to himself during the reading lesson, is not yet ready to read. Until he *wants* to learn, there is not much use in trying to force him. If he were a high school freshman, one would be justified in exerting pressure upon him to learn something that was worth while and practical. The baby in the first grade, however, cannot be forced because he cannot, even under pressure, direct himself. He is so immature that pressure merely disorganizes him.

6. *Maturity of Experiences*: While the average teacher cannot make a survey of her class to find out which children have the necessary experiences for the reading they are likely to do in the first year of school, she can—before she begins a story in a primer—read the story to herself, find what knowledge is necessary

for understanding it, and ask the pupils if they know about this or that element that is necessary for comprehension. If the children show an inadequate background of information, she should either choose another story or else provide them with the necessary background by showing them pictures, telling them stories, reading to them, and so on. Such investigations do not yield exact or objective results, but an intelligent teacher soon finds out through her own observations which stories are inappropriate for which children.

Below appears the case study of an immature child, showing what happens when reading is presented to a pupil who is not yet ready for it.

George was nearly eight years old and in the high-second grade. The teacher reported him as being in constant, but not very serious, disciplinary difficulties. He was also extremely self-conscious, especially about reading, and occasionally became sullen and rebellious when asked to read. When George was tested he showed an I.Q. of 87 but reading ability below the first-grade average. A study of George's school history revealed that he had entered school four months before he was six years old. If, as is probable, he had approximately the same I.Q. as at the time he was tested, his mental age at his entrance to school would have been approximately five years. Throughout the first grade he showed an inability to remember words. This is not surprising in view of his mental development at the time. Moreover, he had a slight speech defect, although it is not clear whether this defect preceded or followed his first efforts at reading. In any case, his failure to pronounce words correctly would be a contributing cause to his inability to learn them. During the first grade George had liked his teacher.

but he disliked the teacher of the second grade. His history and behavior suggested that he had been originally too immature to learn reading, that he had been further handicapped by babyish speech, with a resulting failure in his first efforts at reading. This situation had made him self-conscious and unhappy. His dislike for the second-grade teacher, combined with his handicaps, seems to have precipitated his mischievous behavior and his rebelliousness toward reading. George was given forty minutes of training daily for five and one half months. At the time the training began, he had a mental age of six years and seven months, or approximately the lower limit of mental development necessary for learning to read. At the end of the training his mental age was over seven. He was, then, during the high-second grade just ready to begin reading. His progress during this time was rapid. By the end of the training period, George was reading well enough to go back into his regular class, and his misconduct had disappeared. There appears to have been nothing whatever the matter with this child except that he had immature mentality, immature speech, and immature emotional reactions at the time when he was first given instruction in reading.⁸

READINESS TO READ AT HIGHER LEVELS IN SCHOOL

As stated earlier in the chapter, readiness to read can and should be measured at the beginning of each new level of work. In the following brief description it will be assumed that the achievement necessary for all lower levels is included in each of the upper levels. The requirements for learning to read in the first grade will not, therefore, be repeated for the second;

those in the fourth grade, not repeated for the seventh, and so forth.

1. *Reading Readiness for the Second Grade:* At the beginning of the second year of elementary school a pupil needs an intelligence of not less than seven years and a vocabulary of not less than three hundred words. His vocalizing should not be loud, although a faint whisper with lip movement is permissible. The three brief tests measuring skills that should have been acquired in the first grade are described below.

(1) The first test is extremely simple. The child should know the name—not the sound—of every letter in the alphabet. He does not need to know them in their alphabetical order. If he does not know the names, he will not understand what his teacher means when she tells him he has left out an *r*, or a *b*, or some other letter in pronunciation.

(2) The second test requires merely the sounding of each consonant in the alphabet. The teacher shows the pupil each letter and asks him to sound it. She also presents him with the common initial combinations of letters: *sh*, *th*, *wh*, and *ch*. He should make no errors on this test of sound.

(3) The last test measures his ability to fuse sounds into words. For this test the teacher uses such a list of words as presented below.

and	when	fast	stop	tame
think	baby	man	left	not
did	good	paid	him	red

She pronounces to the child the successive sounds within each word, sounding each separately and clearly *without the slightest fusion*. For the word “and,” for

instance, she pronounces first a short *a* and pauses; then she pronounces the *n* and pauses again; finally she sounds the *d*. The child should be able to fuse the sounds of any word as familiar as those listed above, provided the component sounds are given to him. He should not, of course, see the words.

It will be noticed that the main emphasis at this stage is upon knowledge of sounds and mastery of a small but fundamental vocabulary.

2. *Readiness to Read in the Fourth Grade:* At his entrance to the upper elementary grades a pupil needs a mental age of not less than 8 years and a general reading vocabulary of not less than 1,000 words.* He should be able to read second-grade material with not more than 6 fixations per line and not more than 15 regressions per page. His vocalizing should not be more than a vibration of the vocal cords, without whispering or lip movement. The emphasis at this point is still on vocabulary, with the beginning of measurement in fundamental habits.

3. *Reading Readiness at Entrance to the Seventh Grade:* Before beginning the work of junior high school a pupil should have a mental age of not less than 11 years. His general reading vocabulary should contain not less than 4,000 words.* In addition he needs to recognize about 100 special words in arithmetic, about 250 in geography, 150 in history, 100 in hygiene, and 50 in English composition.† His eye movements should show not more than 5 fixations per line when reading from a fourth-grade book, and not more than 10 regressions per page. He should read fourth-grade material at a speed of 155 or more words per minute.

* Measurement of general vocabulary is described on pp. 130-133.

† Technical vocabularies are described on pp. 152-168.

His score on any good comprehension test should not be below the average for fifth-grade pupils. He should be able to divide 7 out of 10 unknown polysyllables into correct syllables, to pronounce half of them correctly on his first attempt, and to pronounce 7 out of 10 correctly on a second or third attempt.

It will be noticed that the main emphasis for the beginning of seventh-grade work is upon a mastery of sufficient vocabulary, ability to attack a new word, and correctness of eye movements—rather than upon either speed or comprehension, both of which are assigned relatively low standards.

4. *Reading Readiness at Entrance to the Ninth Grade:* The freshman in high school needs a mental age of not less than 13, a general reading vocabulary of at least 6,000 words, and such technical vocabularies as are listed below:

Mathematics	150 words
Geography	300 words
History	250 words
Hygiene	150 words
General science	200 words
English composition	75 words
English literature	100 words
Foreign language (grammar)....	30 words

His comprehension on any good reading test should not be lower than eighth-grade level. He should read sixth-grade matter at a rate no lower than 230 words per minute. If given 10 unfamiliar words, he should be able to look them up in the dictionary and get adequate meanings and pronunciation for at least 9 of them.

It will be noticed that the main stress at this level

is upon the mastery of special words and the development of comprehension and speed, rather than upon the fundamentals that occupied attention at the lower levels.

5. *Reading Readiness for Work in College:* The college freshman needs a mental age of not less than 17, a general reading vocabulary of 10,000 words, and such technical vocabularies as are listed below.

Mathematics	250 words
Geography	300 words
History	300 words
Hygiene	200 words
English composition	150 words
English literature	200 words
Foreign language (grammar)....	50 words
Chemistry, physics, or biology...	350 words

His reading comprehension should not be lower than the average for the eleventh grade on a good objective test and his speed—on eighth-grade material—not less than 300 words per minute. If he is given a series of 10 sample paragraphs taken from different textbooks used in the freshman year in college and if 3 objective questions are asked about each paragraph, he should be able to answer not less than 20 of the 30 questions correctly.

S U M M A R Y .

The material presented in this chapter may be briefly summarized. There should be objective minimum standards of achievement for entrance to each new level in school, and the teacher or teachers who first deal with the pupils entering each level should be allowed the first month or six weeks for diagnosis and

remedial work. If these steps were taken it would still be possible to promote children by age without introducing into each class such a wide variety of academic abilities that no one can teach it successfully. Instead of passing the poor readers along from year to year and allowing them to become further and further behind the average of the class, the school could investigate and in large measure remedy different defects at different levels to bring the lower end of the distribution nearer to the middle. The minimum amounts of work recommended above represent levels that can be achieved, even by dull children.

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XV

INTEREST IN READING

A GREAT deal has been written about interest. Most of the research has unfortunately been restricted to the study of groups rather than of individuals.^{4, 6, 7, 9} The results are what any experienced teacher would expect. In the primary grades children are interested in stories about animals, home life, and fairies. Soon, however, the adventure story takes and holds first place among members of both sexes. With the coming of adolescence, the fascination of the pure adventure becomes less, while the romance and the detective story begin to exert the power that—for many people—they never lose. These generalizations are true enough, but they are not particularly useful because they are too general. Most books intended for use by school children conform to these descriptions. What is needed is some way of dealing with the interests of this or that particular child.

It will probably not help much to give any available test of reading interests because the pupils are too young to know what they really do like. The whole matter can be handled better by a more informal method of procedure. The first essential concerns—as usual—the number and types of reading materials that are necessary. Pupils need to look at and handle a large number of books of all kinds. A teacher cannot find out what a given child's interests are unless she

can let him try all conceivable varieties. Books, magazines, advertisements, newspapers, cartoons, and scrapbooks are all valuable. One should especially avoid the practice of giving children only "worth-while" books and literary classics. The case study below illustrates a valuable point in this connection.

Walter was sent to a remedial reading class with the report that he was practically a nonreader in the seventh grade. His teacher regarded him as her greatest problem. She said that she had tried all kinds of books, but that Walter would not read any of them. When the boy came for his first interview, the remedial teacher could not see him at once so she asked him to wait for a few minutes. About ten minutes later she found him absorbed in a copy of *Popular Mechanics*. At first she thought he was simply looking at the pictures, but he soon proved that he had been reading an article. So far as could be seen, he understood what he had read. When questioned about his failure to do his regular school work, he answered that he saw no sense in the assignments. Upon further questioning, he showed that he could and did read all kinds of technical articles on such topics as how to build radios, how to make boats, and so on. He read the sporting page of the newspaper also. In fact, the things he refused completely to read were the usual children's classics. This boy had been in school for seven years, during which time no teacher had ever discovered that he could read well anything that he was willing to read at all.

All too often teachers fail to find a pupil's interest because the available range of books in the school-room is much too small.

The second essential of a good program in adjust-

ing reading to interests is the complete individualization of the matter. It is not enough to know that the average nine-year-old boy likes stories of adventure, because this information is too general. What one must do is to find out what Billy, aged nine, likes to read. It is of little use to ask Billy directly, because he probably does not know. If he did, he would not need more than casual guidance. His teacher has to know how bright Billy is, what he does with his spare time, what he has already enjoyed in the way of books, and so on. For research purposes Billy can be generalized; for teaching purposes he must be individualized. It is therefore necessary that one approach the problem of interest from a purely personal standpoint, studying and observing each child from day to day in an effort to discover his interests at the moment.

The most practicable plan the writer has ever seen consisted of a school library established in each room, a library whose books had been selected in the following way: At the beginning of the year the teacher asked the children to bring from home any books they owned that they had read and were willing to loan to the school. They were to bring only those books, magazines, or other types of material that they had enjoyed. These items were placed upon a large table in the room. No contribution was omitted. During each day there was one free-reading period. The children kept a list of the things they read. They were allowed to select anything they liked. The one requirement was that they must read something. During the period the teacher went around the room and observed what each pupil had chosen. Since the books had been brought by the children, they were all materials that were interesting to at least one pupil. The children in the class

showed their interests clearly enough. All the teacher had to do was to guide them. Thus, if a child began by reading *Peter Rabbit*, she suggested other stories about animals. Gradually he read better stories of the same type, progressing eventually to such books as *Black Beauty* and the *Jungle Book*. Some pupils read nothing but cartoons, advertisements, and nursery rhymes for months. The really important thing was, however, that everyone read something, and read it eagerly. So long as children maintain this attitude toward reading, they need nothing but greater maturity to develop better skills and tastes.

It would be very nice if all children liked good literature from the start. The fact is that they do not. A teacher can force a small child to sit still and look at a book, but she cannot force him to read it. The only thing one can do is to build on whatever interests are already in existence, trying to raise the level as quickly as possible. It is useless, however, to restrict a pupil's work to "good" books before he is mature enough to enjoy them. When a teacher allows only classics in her room, she is not necessarily developing good taste; she is quite as likely to be developing a profound dislike of the printed page among those children who are too immature for the only kind of material she will permit. One has to begin with what a pupil will read at all and use the interest he shows to guide him into a selection of better books that rest on much the same sort of interest. Many teachers make the mistake of beginning at the top instead of starting with anything a child will read willingly and gradually working up to the top from there.

It is entirely possible, however, by individualizing the matter, to bring about a greatly increased amount

of reading if one provides enough different materials and allows children to choose what they like. Thus, in one experiment,⁸ in which these principles were followed, the average number of books read per year increased from 15—under ordinary conditions—to 55. As the year went on, the pupils showed better and better taste in their selection of books. At first, however, they were allowed free choice, regardless of quality. Once a child had revealed the nature of his interests he was guided into choosing books of greater merit that would have a similar appeal.

S U M M A R Y

There are, then, three essentials in the adaptation of reading to the interests of children. The first is to use all conceivable kinds of materials, regardless of their literary merit. The second is to treat each child as an individual. The third is not to expect all pupils to like "good" books from their first day in school. Such books are too long and too hard for the poorer readers, and too complicated for dull or immature children. If a teacher is willing to keep a large supply of reading matter on hand, to study each pupil, and to let children act like children, she will have relatively little difficulty in using their interests to motivate work in reading.

B I B L I O G R A P H Y

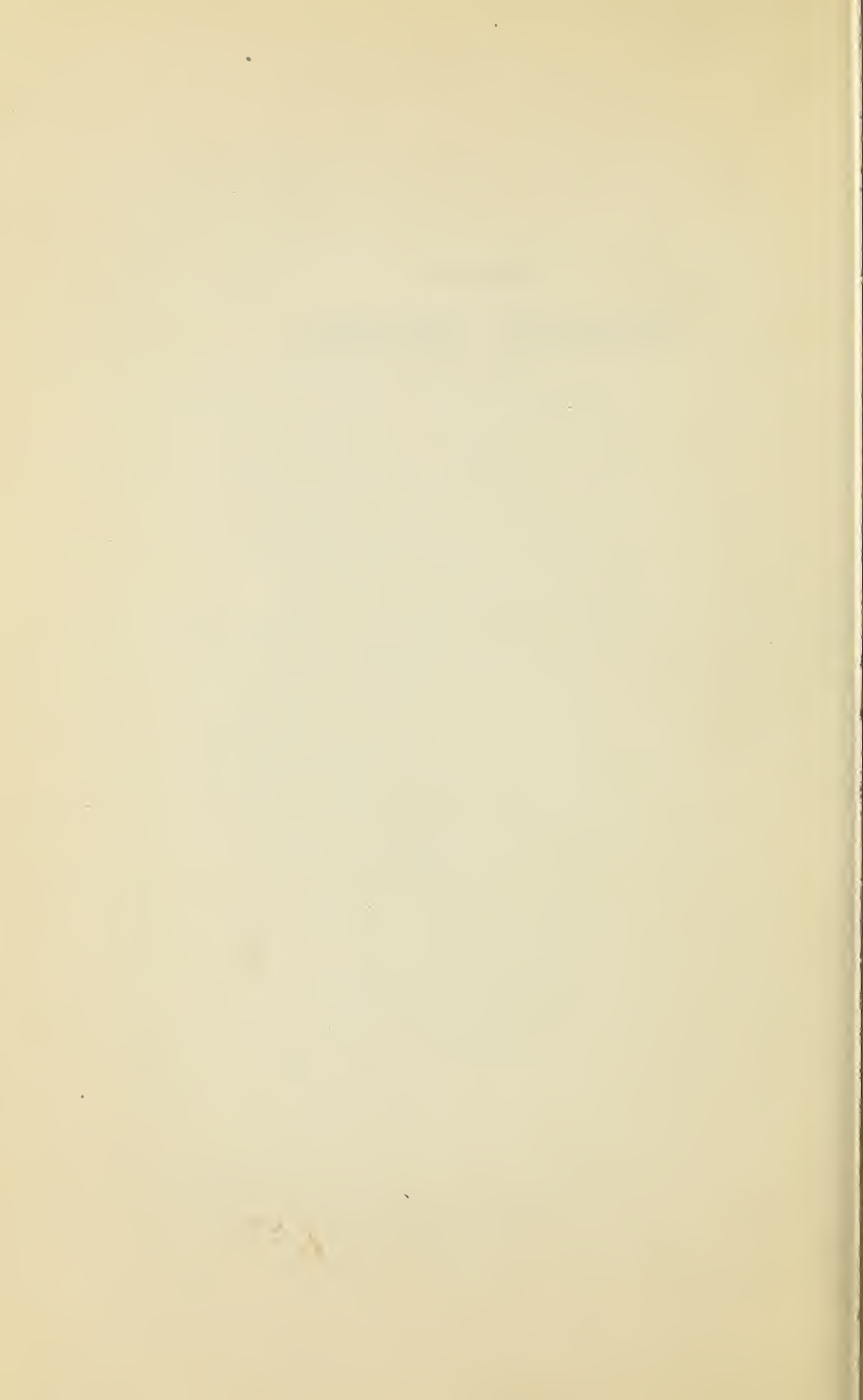
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PART VI

REMEDIAL READING



XVI

THE ADMINISTRATION OF REMEDIAL WORK

A BROAD approach to the problems of remedial reading will divide the matter into methods of prevention and of cure. Obviously, the more defects one can prevent, the less there will be to remedy. The most significant contribution of the remedial reading class has thus far been its suggestions for the prevention of reading difficulties. Since the preventative and curative phases of the problem are quite different from each other, they will be considered in separate sections.

PREVENTION OF READING DIFFICULTIES

The first and perhaps most fundamental measure is the postponement of reading until a pupil is ready to read. Teachers of remedial reading have, from the first, been impressed with the fact that many pupils are poor readers because they began before they were sufficiently mature, developing bad methods through sheer inexperience and inability, and then slipping so far behind their class that they never had time to learn any better methods of procedure. At least a third of the pupils in a remedial reading class would not be there if the teachers of the primary grades had waited for these children to mature before beginning instruction in reading. The present interest in reading

readiness, especially in the first grade, should prevent the development of many hopelessly bad readers.

A second suggestion for prevention of reading difficulty is the establishment of definite standards for entrance to each new level of work in school. The old-fashioned school, whatever its other shortcomings, at least had definite standards for each grade. To be sure, these standards were all too high for the average ability of normal children, but they at least existed and teachers knew what they were. Standards of readiness to read at each successive level in school should again appear. They should, of course, be minimum standards of performance, but they should be perfectly clear and definite and they should not require more ability than children possess. They should consist of skills and knowledge that can be developed by those children who do not at the moment possess them. If the teachers of the low fourth, low seventh, and low ninth grades would spend the first two weeks of the semester in analyzing and testing their pupils, and the next month in remedying the shortcomings shown by analysis, the number of candidates for the remedial reading classes would be materially reduced. In effect, the teachers in these three grades would start the year with six weeks of remedial work in their own rooms; only those children who failed to meet the minimum standard would then need attention in the remedial reading class. Such standards of readiness at successive levels in school would be of considerable aid in the present situation.

A third suggestion, which has emanated from remedial work, concerns the selection of reading material at all levels. The teacher of the remedial class finds that she cannot use the required reading at any level

for training purposes. The average material is usually too hard and often uninteresting. Perhaps the chief source of difficulty is the use of too wide a vocabulary, both of general and of technical terms. A fifth-grade book, for instance, may use 10,000 different words when the average pupil's vocabulary is between 4,000 and 5,000. One must naturally present pupils in each grade with some new words or their vocabulary will not increase, but the number is usually far more than many pupils are able to learn. The same thing is true of textbooks used in junior and senior high schools. These books are loaded with difficult words used only once or twice. In a single textbook there may be 2,000 such special terms. No child can master the necessary subject matter and a vocabulary of 2,000 words at the same time. Since about 80 per cent of these words occur not more than twice in a 300-page book, they cannot possibly be so important that they could not be omitted. To be sure, the various reading books used in the elementary grades and the textbooks for the upper grades are constantly being improved. If the improvement continues long enough and is fundamental enough, there may some day be a sufficient number of books adjusted to the reading abilities of children. As long as the material remains too difficult, classes in remedial reading are sure to thrive.

Finally, it is suggested that more individual instruction be introduced into the regular reading classes. Many sets of exercises, such as have been described in previous chapters, can be used easily and with great profit in the ordinary reading class. Group instruction is efficient and economical in direct proportion to the similarity of the pupils being taught. In the modern school, however, the pupils in a given grade

differ widely from one another. For them, class instruction is unbelievably inefficient. There is no subject in school about which an equal amount is known by any two pupils in the class. Nor is it merely a question of amount; no two pupils know the same combinations of facts or show the same development of skills. Anything one is likely to tell the class is unnecessary for some pupils and totally beyond the comprehension of others. In every subject in which diagnostic and remedial drill has been introduced as a routine classroom procedure, the progress over class instruction has been enormous. In spite of repeated demonstrations of this fact, many teachers are still highly resistant to individual work—probably because they do not know how to teach individually without letting their classroom get into a state of utter confusion. They cannot, indeed, give much individual instruction unless they have *individualized materials with which to work*. The fifth-grade teacher who has only a fifth-grade reader and a half-dozen story books cannot possibly do much in the way of individualized instruction. The high school teacher of history who has a basic textbook and a few outside references is practically condemned to class instruction whether she likes it or not. If a school wishes to prevent reading difficulties rather than cure them, it must provide each teacher with individualized materials so that she can do whatever remedial work is necessary at the time difficulties first appear. Otherwise she is not likely to notice the difficulties because she does not give personal attention to each child. Whatever defects arise will remain for years until they are so ground in by repeated use that elimination of them is extremely difficult if not impossible.

REMEDIAL MEASURES

The class in remedial reading is admittedly a place where defects are cured, not prevented. In order to give this curative treatment in the best way to the most appropriate group of children, several problems of administration must be met and solved.

1. *Assignment of Pupils to Class:* The first problem is obviously that of selecting pupils for this type of work. Those who will profit best by the instruction to be given are children with an I.Q. not less than 85 (90 for high school) and reading abilities not more than three grades below their present grade placement. Children who are definitely stupid are not appropriate members of the remedial reading class, because the methods used are not suited to their level of intelligence. They will improve, but not enough to warrant the time and energy spent on them. Disciplinary cases should not be sent to the class, unless the misconduct is definitely associated with reading. If there is any evidence that a pupil misbehaves because he cannot read, he may properly become a member of such a class; but he should not be sent merely because he is a general nuisance to his room teacher. The highly nervous child has no place whatever in the class, because there he will be subject to more pressure than if he remained in his own room. Finally, the remedial teacher cannot handle, in the same group with normal children, the nonreader or the pupil who is five or six grades behind his present grade placement. The remedial reading class should exist for normal pupils, who for one reason or another have failed to develop the expected skills in reading. With them the recommended program of work brings results.

The stupid child, the pupil who is constantly in need of discipline, the nervous reader, and the non-reader all need assistance, but the type of work given in the remedial reading class will not help them, and their presence there will prevent other pupils from making the progress they otherwise would. If the school wants remedial work done with such children it should reserve one or two periods a day for them alone. A teacher can handle not more than six of these difficult pupils at once. Fortunately, there are not many of them. These special types should therefore be put in a small group by themselves and taught by methods quite different from those appropriate in the usual remedial classes.

2. *The Teacher of the Remedial Reading Class:* The teacher of such a class needs, first of all, an adequate training in methods of diagnosis and remedial work. All too often a school decides it will have a special class, even though it has no teacher ready for instruction. It consequently looks over the schedules of its staff and picks out some teacher who either appeals to the administration because of her personality or happens to have a particular hour free. Often this teacher does not know for more than a week in advance that this special type of work is to be part of her program. Naturally she flounders about; she has no appropriate materials, and she has only a general knowledge of the problems involved. She has nothing more than her own observation of pupils upon which to base a diagnosis. It would be a miracle if her pupils improved much more than they would have done if left in their regular classes. What she almost inevitably gives them is smaller doses of exactly the same reading material to which they have already been ex-

posed and by use of which they have developed their bad habits. If a school wishes to establish a remedial reading class, it should give the prospective teacher at least a semester in which to prepare for it. She will probably need to take a course in diagnosis, and she will certainly require time to construct and organize her materials.

As a person, the teacher needs, in the main, three characteristics. First, she should sincerely want to help children who cannot read; that is, she should have a dash of the real missionary spirit. Teachers who are interested primarily in superior work, those to whom teaching is merely a business, or those who are impatient with errors, have no place in work of this type. These statements do not mean that the person chosen should be sentimental. She should merely be anxious enough to help these children that she does not mind working hard at her job. Second, she should possess a high degree of ingenuity. This requirement is necessary because she will have to invent many of her own materials as she goes along. If she is a type of person to whom unconventional methods never occur, she will not be a success in this kind of work. In remedial reading one must be ready to use anything and everything, adapting it to the needs of individual pupils. Even if a teacher is provided with many sets of remedial exercises, she will still need ingenuity to meet the highly individual problems presented to her by different children. Finally, she must be systematic. Of all traits, this is the most necessary. The essential feature of a remedial class is that fifteen or twenty children in the same room are all doing something different. No two are reading the same exercise, and often no two are reading even the same

type of exercise. One child is studying phonograms, another child is listing technical words from his textbook, another is sorting vocabulary words, two are in a corner watching each other's eye movements, a sixth is reading with his fingers in his mouth to stop vocalization, two more are reading against time—but one of them is using an exercise from the third grade and the other from the eighth—one is drilling himself in phrase reading, one is poring over a dictionary, two are taking tests—but in different phases and at different levels—one is reading paragraphs to find the main idea, two are playing solitaire with different kinds of vocabulary cards, and one is making an outline. Each pupil in the room is doing the thing that, at the moment, is most necessary for him to do. A teacher who is not efficient and systematic can never keep all this work going at once without confusion. She must not only be efficient herself; she must train pupils to get their own materials and put them back. She must be systematic in keeping her records, or she will never know where any child is and whether or not he has progressed.

In selecting someone for remedial work a school should, then, pick out a teacher who is industrious, interested in helping people, ingenious, and systematic. Having selected such an individual, they should give her a semester, and preferably a year, to prepare herself for the particular demands of her new job.

3. *The Administration of the Remedial Reading Class:* (1) Perhaps the first detail is to rechristen the class. It badly needs a new name. Any of the following titles are preferable to the one usually employed: The Psychology of Reading, Supervised Reading, Advanced Reading Methods, Modern Reading Methods,

Supervised Study, Psychology of Study, Personal Efficiency. The name of a class seems to exert a profound influence in determining the attitude of pupils toward it. If it is called "Remedial Reading," some pupils feel they are being punished when they are sent to it, while others are sure their friends will look down upon them. Most teachers spend the first two or three weeks combating this attitude. A mere renaming of the class always reduces and often eliminates the usual resistance of pupils to anything new or—to their minds—queer.

(2) Pupils often resent the remedial reading class if it gives them no academic credit. One cannot blame children for this point of view; they learned it from the school, which itself puts great emphasis upon marks and hours. Indeed, the entire program in school is based on credits and marks. The pupils know that they must complete a given number of hours in order to graduate from school. Naturally they object to a noncredit course. The remedial reading class should therefore always carry credit. This arrangement not only lessens resistance, but it enables the teacher to give daily assignments to be done outside of class. As a result the children progress far more rapidly than they do in a noncredit course, in which outside assignments—even if given—are rarely prepared. The amount of credit need not be more than an hour.

Many teachers object to giving credit to a pupil for learning, in the eighth grade, skills that he should have learned in the fourth and fifth grade. They argue that he has already had credit for mastery of these skills, even though he did not happen to acquire them. This argument is perfectly logical. Children in a remedial reading class, however, work as hard as in any other class on their schedules and they learn at least

as much, if not more. Since the school customarily rewards effort and progress by means of credits and marks, progress in this practice course should also be thus recognized. In any case, it is not as if a school never gave credit twice for learning the same thing, because it obviously does. For instance, a pupil may take a course in general mathematics and follow it with one in algebra; there is plenty of overlapping between these two courses, but nobody thinks of reducing algebra credit because of work in general mathematics. In English composition, a pupil gets credit, in *every* grade from the fourth through the twelfth, for learning where to put punctuation marks, even though he still does not know where to put them. In the modern school a pupil is promoted after he has remained in a given room for a prescribed period of time; what he has accomplished does not seem to be especially important. He gets credit for sitting, not learning. The place where credit should have been denied the pupil who comes to the remedial reading class is in the fourth and fifth grades, in which he was not held responsible for learning the necessary skills; during these years he received wholly undeserved reading credit. Having handed him something for nothing, one is hardly justified in now handing him nothing for something! In the remedial class a pupil will work hard—often for the first time in his life—and he will learn. He deserves the customary academic reward for successful effort.

(3) An absolute essential in the administration of remedial work of any kind is the reduction of a pupil's schedule to make room for the course. If a pupil with a reading retardation of one or more years is carrying four classes, he already has more work

than he can possibly cover satisfactorily. If a period a day of possible study time is taken for remedial reading and nothing is eliminated, he has less time than ever. Moreover, the remedial work will probably at first reduce what reading efficiency he has by undermining the bad habits he has built up in previous years. He will go through a period during which he is losing former habits and has not yet gained any new ones. During this time he gets further and further behind in his regular class work. Far from being a help under such circumstances the extra class is a burden. *A child's schedule should always be reduced before he starts his remedial work.* The school should always remove the course making the greatest demand upon reading skill. If the pupil needs a great deal of practice, it is best to remove two courses. If only one class is subtracted from his load, the credits received through remedial reading will result in little, if any, reduction in the total number of units. Some pupils, however, need a real reduction, not merely a substitution; for these children the schedule should be reduced until it can be carried. Without such adjustments the remedial teacher will be unable to make substantial progress, and everyone's time and effort are wasted.

(4) It is desirable that the class meet for one period each day. The pupils are building up new habits and need constant drill and review; otherwise they will forget too much between each two meetings of the class.

(5) The length of time a pupil remains in the class should be subject to the teacher's decision. Some pupils finish their remedial work by the middle of a semester, when it is too late for them to enter any other class. They may, however, be given an opportunity either to

read as widely as possible, following their interests, or to prepare themselves for courses they will take during the next term by reading the textbooks, under supervision. Other children will not be ready for dismissal at the end of a semester. These should be returned to the remedial reading class for a second semester and should again be given credit, although perhaps a reduced amount. They will not, of course, be doing the same work. It is almost fatal to interrupt a remedial program before it is completed, because the pupil is in the intermediate state of having reduced the efficiency of his former bad habits and having not yet gained adequate skill in his new reactions. If he is allowed to leave at this point, his final state will be much worse than his original condition. Because work in the class is so fundamental to the pupils' future progress, dismissal from class should rest exclusively upon the judgment of the teacher; it should not be subject to the ordinary academic rules.

MATERIALS AND PROCEDURES IN THE REMEDIAL READING CLASS

1. *Materials*: A teacher needs special exercises—and plenty of them. The least useful materials for her purposes are basic readers or current textbooks. In the first place, the pupils have already been exposed to these books without much success. In the second place, such books are quite definitely labeled as being appropriate for pupils in a certain grade. A seventh-grade child may read with fourth-grade ability, but he resents being given a fourth-grade reader. In fact, the fourth-grade reader is totally inappropriate because its content is far too childish for the seventh-grade

pupil's interests. The teacher needs various series of exercises and other types of reading matter. Whatever special materials she uses she will probably have to make for herself; only a small number of appropriate ones can be purchased. Remedial exercises are not labeled as to the level of reading they represent, although they are usually numbered so that the teacher can recognize their nature. She merely tells the pupils that they are to take the exercises in a particular order; at no time does she tell them which selections were taken from which grade.

In addition to special exercises the teacher should be supplied by the school librarian with a long list of books dealing with many different kinds of stories. These books should be, in so far as possible, easy in vocabulary but interesting to the level of mentality represented by the students in the class. For instance, most seventh-grade boys are interested in aviation. Stories of famous fliers, brief histories of aviation, or stories about airplane pilots all contain material of interest. If these stories are also easy, they are ideal. Most useful materials are not to be found in the school libraries, however. The easiest stories about aviation appear in two or three of the cheap magazines sold at the corner drugstore. The best history of aviation the writer has encountered was published by a commercial oil company. Perhaps it was written by an employee who did not know more than a thousand words himself! In any case, he used a minimum of different words and a maximum of easy ones; the resulting narrative was far better for remedial use than most books on the same subject. One needs a large amount of interesting, varied, easy reading matter. A daily newspaper is a desirable addition. The school should

supply the class with whatever is available, even if the nature of this material is sometimes highly unconventional.

2. *Procedure in the Classroom:* During the first month the teacher should devote herself to the task of diagnosing each pupil's defects. Since she will work with only one pupil at a time and since the diagnosis of each will take at least a couple of days, she needs to make some general assignment to the rest of the class during the first month. She can allow the children to study their current lessons, thus making her class a sort of supervised study period. She can start them on some of the simpler exercises for developing comprehension—on the principle that these drills cannot possibly do any harm. These are the simplest exercises for the children to work with alone. She may, if she prefers, show them the available books and magazines and newspapers, and tell them she requires merely that each pupil spend the period reading *something*.

The diagnosis of eye movements, vocalization, and phrase-reading must be done individually. This part of the diagnostic work may be completed with all members of the class before anything else is begun, or it may be scattered, a day at a time, throughout the first month. In a forty-minute period a teacher can analyze the fundamental habits of two students. During the first weeks she should give a test in general vocabulary to the entire group, so that she may get some estimate of the total size of their reading vocabularies. Since all pupils will be enrolled in subject matter courses, they will need certain technical vocabularies. She should therefore follow up the testing in general vocabulary—which will not take more than one

or two periods—with specific tests in those technical fields in which each pupil is enrolled. The tests will, of course, be different for each pupil and will take at least a week to administer. Finally, she should give a test in general comprehension and rate, so that she may know at what grade level she needs to begin remedial instruction for each child. If the children have been given a reading test before they were selected for the class, she can use any scores in rate and comprehension thus obtained, instead of giving further tests of her own. Since the total amount of testing—in case she has no previously obtained results available—is large, this work can best be alternated with free-reading periods, demonstrations, and individual diagnosis.

At the end of this diagnostic work the teacher should have filled in, for each pupil, a chart of the type shown on page 324.

This record is, of course, filled out as the teacher goes along. As soon as each child's record is complete, she should go over it with him and outline his course of study for the rest of the semester. After discussing with him his specific weaknesses, she assigns definite remedial series, writing her assignment down on the record sheet. The pupil then knows what he is to do and why. He starts in with the easiest exercises of the first series on his list and works until he has completed that unit of work. He then starts on the next series. He omits those exercises that do not appear on his individual assignment sheet.

From the time the pupils start their remedial work, until they have finished it, the teacher has two main functions: First, she tests the proficiency of each child when he thinks he is ready to pass from one level

Name _____ Grade _____ Age _____			
Eyesight _____			
	Beginning	End	Difference
A. Eye Movements 1. No. fixations per line 2. No. regressions per line 3. No. lines hit accurately at the beginning			
B. Degree of Vocalization			
C. Phrase-Reading 1. Average no. of exposures necessary to read a phrase of four words			
D. Rate 1. Words of ____ grade material read per minute.*			
E. Vocabulary 1. Estimated general reading vocabulary 2. Special vocabularies:† No. of essential words known a. _____ b. _____ c. _____ d. _____ e. _____			
F. Comprehension Score			

Recommendations:

General: _____

Particular Series: _____

*The material should be selected from that appropriate for children three grades below the particular pupil's present placement.

†The subjects tested will differ from child to child, depending upon each pupil's current schedule.

of difficulty to the next in a given series and, secondly, she helps those who get into difficulty. If the remedial work is completed before the end of the semester, it is best to use the remaining time for either free-reading or the preparation of current reading assignments in other courses.

At the end of the semester a teacher should reserve about two weeks to give group tests in speed, comprehension, general and technical vocabulary, and individual tests in eye movements, vocalization, and phrase-reading. The results from these tests should be entered upon the pupils' record sheets. The children themselves should see these results, so that they may know in what respects they have improved, and to what extent.

2. *Gathering Proof*: It is most desirable that the teacher should have these end-tests, not only for her own satisfaction and that of the pupils, but as evidence that her work is successful. One never knows when some critic will object to a continuance of remedial work. Probably the critic is right in feeling that such work ought not to be necessary, but he is condemning the wrong thing in attacking the reading class. What is really wrong is the dissociation between the promotion policy and the curriculum. Until these two forces are brought into harmony, someone must continue to pick up the pieces. Nevertheless, the teacher is sometimes likely to find herself in need of justification. Proof based upon such record cards as those suggested above will do much to answer criticism and to justify the course upon objective and nonargumentative grounds. It is also a good idea for her to follow the progress of the pupils in her first few remedial classes through their remaining work in the school. If she has

figures comparing their progress with that of other pupils of the same intelligence from former years who did not receive remedial training, she will have the necessary facts with which to defend her work. She should not expect that all of her pupils will become academic successes. However, if her work has been well planned and well administered and if she has been supplied with appropriate materials—both as to type and amount—the graduates of her class should do appreciably better work than pupils of the same initial ability in both intelligence and reading who have received no remedial instruction.

S U M M A R Y

If a school is going to offer remedial reading at all, it should be prepared to do a good job. Halfway measures, instead of achieving half the results of full measures, are likely to produce no results at all. A successful remedial reading class rests upon the contentment of its pupils, the proficiency and efficiency of its teacher in diagnosis, and the appropriateness of its materials. Any school that does not wish to make the necessary effort and to spend the necessary money had better let pupils stay in their regular classrooms rather than to attempt a remedial reading class in which the teacher is untrained in special techniques, in which the reading materials are of the conventional types, and toward which the pupils have a feeling of resentment. A school should either go all the way or it should not go at all.

XVII

ADVICE TO THE TEACHER

IN the preceding chapters, many procedures and exercises have been described. Some of the techniques are appropriate for regular class consumption. In fact, no exercise described in the previous pages is useless in a class situation, but many are impracticable. The following suggestions may help teachers to select the most valuable exercises of those described.

THE CLASSROOM TEACHER

There are a few procedures and exercises that are particularly appropriate for the classroom teacher. Because most of her work is preventative rather than curative, the following three general suggestions are therefore strongly recommended. First, the teacher in any grade should use silent, not oral, reading whenever possible. Second, she should make available to her pupils a large amount of easy, interesting, informal reading. It is not in the least necessary that these materials be of a literary character. A child will learn to read just as well—if not better—by use of magazines, comic strips, newspapers, and advertisements as by means of standard children's classics. The real essential is that he should read. Third, teachers at all levels can give their assignments in such a way as to emphasize meaning. The routine assignment to "read

the next ten pages for tomorrow'' should never be used. Always there ought to be some clue as to what sort of meaning the pupil can obtain from the pages.

In addition to these general suggestions, the following specific exercises may be used in the classroom without disruption of normal class procedures. (1) Throughout the elementary school there should be some type of phonetic drill. In the primary grades the children should learn to sound the letters, to fuse sounds into words, and to recognize various word-families. In the upper elementary grades, drills on dividing words into syllables, pronouncing them, and using the dictionary will be found useful. Exercises dealing with these topics should help materially in developing one necessary skill—namely, the technique for attacking unfamiliar words. In addition, the pupil should acquire in elementary school good fundamental habits and an adequate general vocabulary. To reach these two objectives a few further exercises are recommended. The use of flash cards—especially when they are used by the children themselves—will help in learning to read phrases. These exercises are described on pages 111-112. The teacher will also find the series of eye movement drills described on pages 96-107 highly valuable for the slow readers in her room. She can also train the vocalizers in her room to read with their fingers in their mouths until their inner speech has disappeared. These three procedures will do much toward eliminating slowness in reading. Every teacher is urged to use the individualized drill in the vocabulary buildings as described on pages 142-148. If she arranges her groups of three so that there is one good reader in each group, there will be little need for the children either to consult her or to use the diction-

ary, because the best reader will know practically all the words. In this way the building up of vocabulary becomes a group undertaking, although the learning of specific words inevitably remains an individual matter.

In comprehension, the elementary school teacher needs chiefly a single type of exercise—the series concerned with reading to answer a given question. If an elementary school pupil can read appropriate material well enough to find the answers to simple questions about it, and if in addition he develops the habit of looking for answers while he reads, his comprehension is as good as can be expected of him in view of his immaturity.

(2) In junior high school the chief objectives are concerned with the development of adequate technical vocabularies and of a more mature comprehension than the children have previously shown. For the teacher in these grades, the program of work described on pages 185-187 in technical vocabulary is especially appropriate. She does not need to use the entire list of special terms unless all of them are needed in the pupil's daily work. These procedures will solve her most pressing problems. In addition, the teacher in each special subject would do well to select from her regular reading matter the material necessary for one or two sets of exercises in comprehension. Thus, the instructor in general science is advised to construct series of exercises dealing with grasping the main idea of paragraphs and with outlining. It is in junior high school that entire books presenting expository material are first encountered; if a child does not know how to grasp a paragraph as a unit and how to make a simple outline, he will not understand his textbooks. As mentioned earlier, each teacher in junior high

school should give training in the special problems of reading within his or her own field.

(3) In the senior high school the same two problems appear as at the immediately lower level, but the technical vocabularies are much larger and the degree of comprehension required is higher. A high school text in chemistry differs from a junior high school text in general science chiefly in the larger number of technical words used and in the complexity of the reading matter. The high school instructor should therefore use the same system of teaching technical vocabulary as described on pages 185-187, but with a longer list of words. For bringing about a greater degree of comprehension two exercises are especially recommended—those for outlining and making inferences. High school pupils are old enough to infer ideas not explicitly mentioned, but they often fail to find such meanings because they are not looking for them.

THE TEACHER OF REMEDIAL READING

Whatever materials a teacher decides to use she should have prepared before she begins her course. It is better that she should have a few complete series, already mounted on cardboard and ready for use, than that she should have a scattering of exercises of a larger variety of types. She should, of course, in addition to the exercises, have on hand a number of magazines and easy books. It is also suggested that she make up two or three scrapbooks of advertisements, in each of which there is more or less reading matter. If she has even one such book to use as a model, she can ask the pupils to make similar books dealing with different topics, requiring each pupil to be able to

read whatever material appears on every advertisement he puts into his scrapbook. By the end of a year she will have all the scrapbooks she needs for future classes.

No teacher should attempt to prepare a complete set of all possible materials the first time she teaches a class in remedial reading. If she has in readiness a few complete series in the various phases of reading, she is well enough equipped to start. In succeeding semesters she can add further exercises, until her materials are as complete as she thinks necessary.

For remedial work of the fundamental habits the following exercises are suggested. A teacher will need the series for developing correct eye movements described on pages 96-107 and the series of reading against time mentioned on pages 92-93. She will need also flash cards (pages 111-112) and the sheets of exercises for phrase reading (pages 107-114). These four types are sufficient, provided she has the recommended number of different exercises at each grade level, to remedy the common defects in the fundamental habits. She should remember that she needs between five and ten exercises for each grade level, beginning three or four years below her own grade and continuing through the type of material she is at present using.

For remedial drill in vocabulary a teacher should prepare the exercises on word-families (pages 177-178) and as many of the card games (pages 178-185) as she has time to make. A series of fifteen or twenty exercises of the type described on page 180 are especially helpful in developing vocabulary, because the drill is so condensed. In order to get a single item right a pupil must recognize the meaning of five different words. If a sheet contains thirty items the pupil must

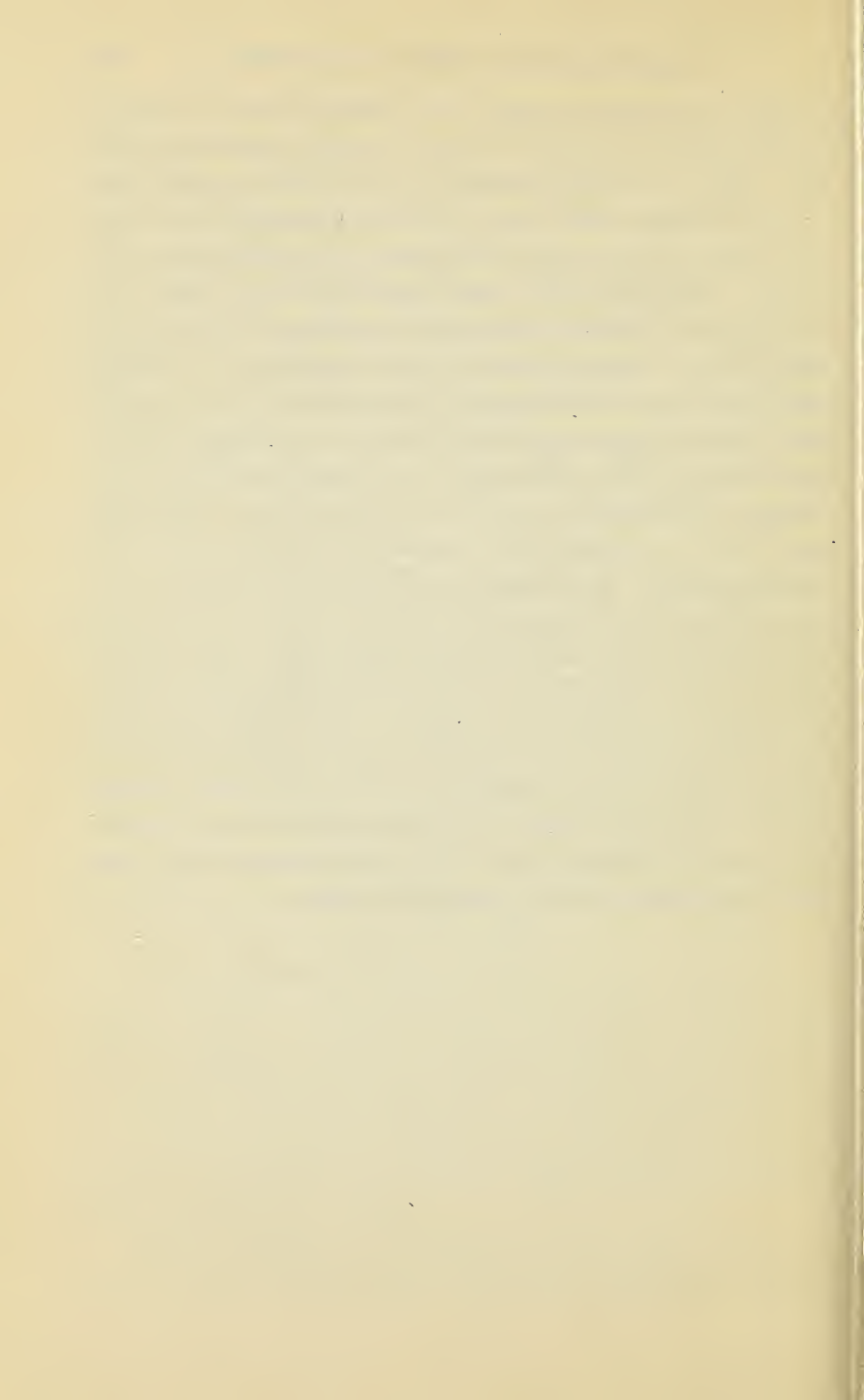
identify 150 words; on twenty such sheets he must recognize 3,000 different terms. There is no other exercise that gives such concentrated drill. Finally, the remedial teacher will need to use an individualized technique for teaching vocabulary (pages 142-148). She may select a given set of words from the *Teachers' Word Book* for this work, or she may require the pupils to write down on their cards the unfamiliar words they meet in any of their daily assignments. In general, this second procedure is the better for remedial work, because there is a stronger motivation. With these four types of exercises one is well equipped for the development of a better reading vocabulary.

For training in comprehension, a teacher needs at least three complete sets of exercises: those dealing with finding main ideas (pages 215-218), answering questions (pages 222-225), and making inferences (pages 228-232). These three are as many as she can probably prepare for her first work in remedial reading. The following semester she would do well to add the series on understanding of details (pages 218-222) and in successive semesters the remaining types of exercises recommended in the section on remedial work in comprehension (pages 211-247).

In her preparation a teacher must not fail to supply herself with tests for each grade, so that she can tell when a pupil is ready to progress from one level of difficulty to another. These tests are, of course, no different from the exercises, except that there are no answers for them in the answer file. Incidentally, this file of answers must also be ready before any exercises at all can be used.

It is essential for individual work that all exercises be self-administering and self-scoring. It is only

by this arrangement that the teacher can be free to do diagnostic work as needed, to give tests to children who are ready for them, and to help pupils who are in difficulty. Moreover, by this technique the children learn to manage themselves; they develop self-control, self-direction, and self-criticism. Such an arrangement puts an end to the prolonged immaturity which is the chief cause of poor reading for many children. The work done by the teacher in the remedial reading class—provided she has the proper materials—is not hard, although it is exacting. The whole matter is primarily a question of educational engineering. That is, the instructor must first isolate those who need attention, then diagnose their specific faults, and then arrange the remedial work so that each child takes only those exercises he needs and as many of them as he needs. The reward for all this labor comes in seeing the children develop out of their slowness, carelessness, and boredom into a new attitude of enthusiasm, accuracy, and efficiency. A teacher can hardly hope to spend her days to more purpose than in making good readers out of bad, thus opening to them the treasures hidden in the world of books.



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